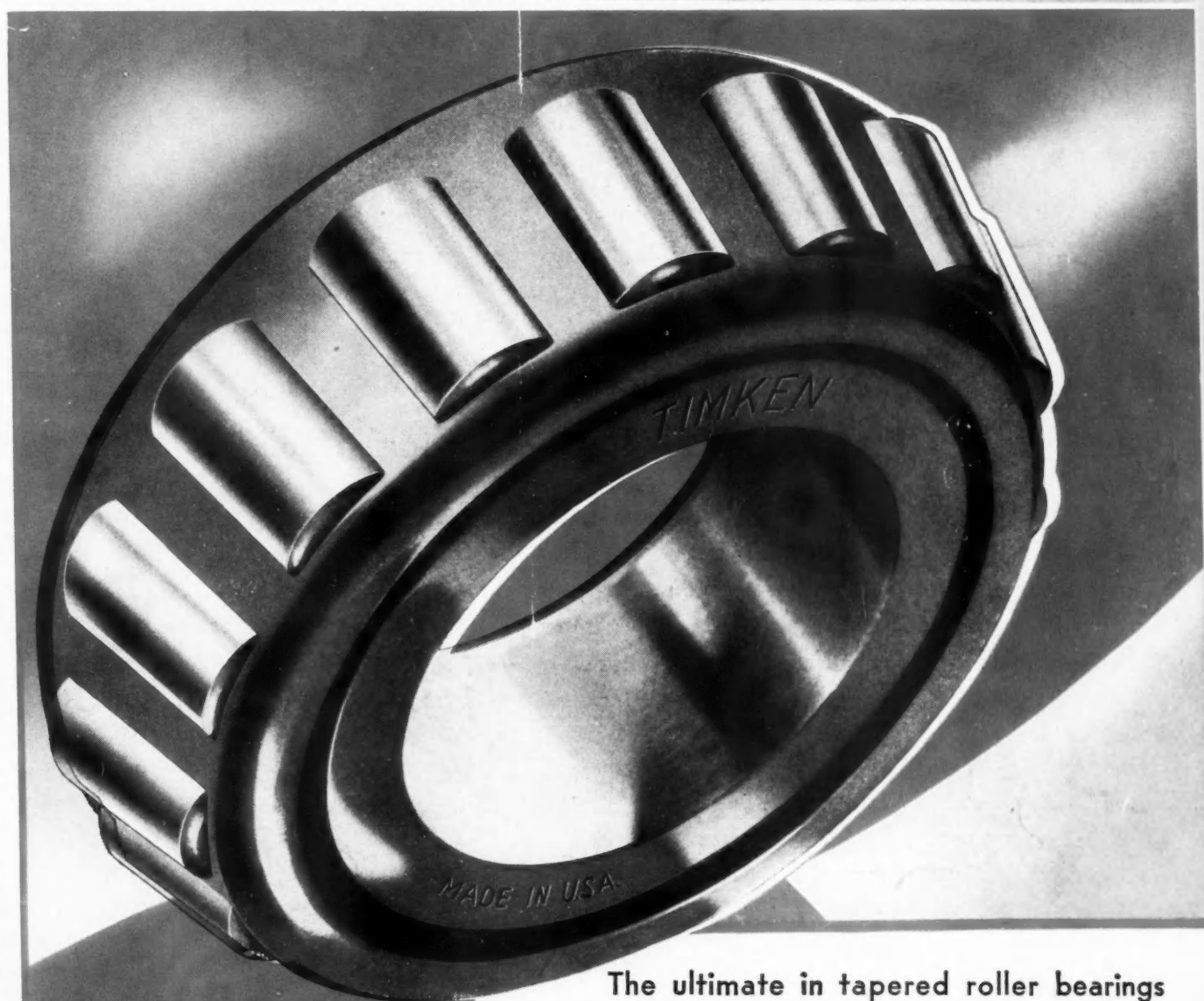


OCT 31 1938

# AUTOMOTIVE INDUSTRIES

LAND — AIR — WATER

OCTOBER 29, 1938



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Thus, in solvent Massachusetts, manufacturing corporations enjoy the lowest taxes in the United States. The state tax has not been increased since 1920 and the only local tax paid by manufacturing corporations is the tax on real estate. There are no onerous "extras", such as municipal property taxes or high levies on corporations which carry

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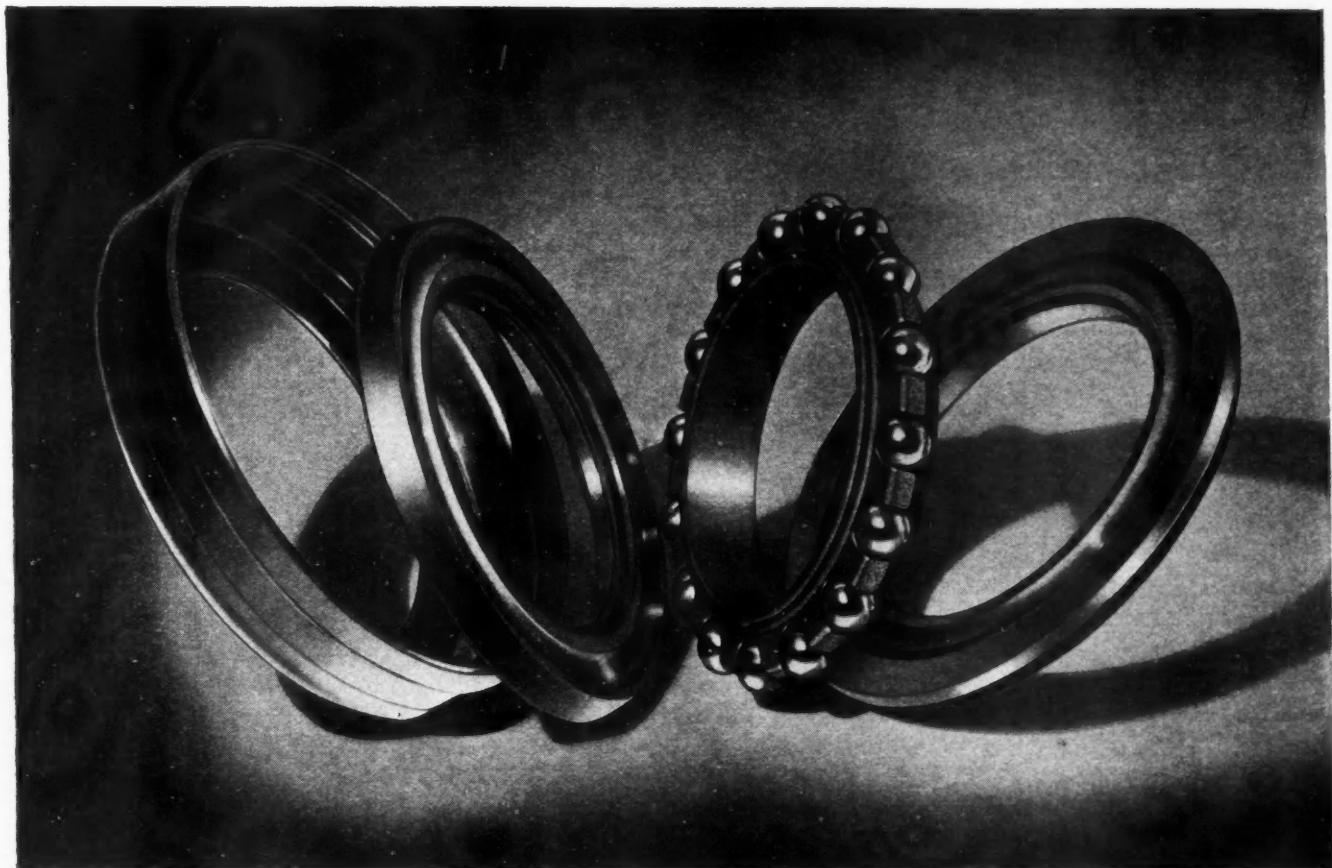
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A brief book of accredited facts, *The Industrial Advantages of Massachusetts*, will be sent on request. Your further inquiry is invited.



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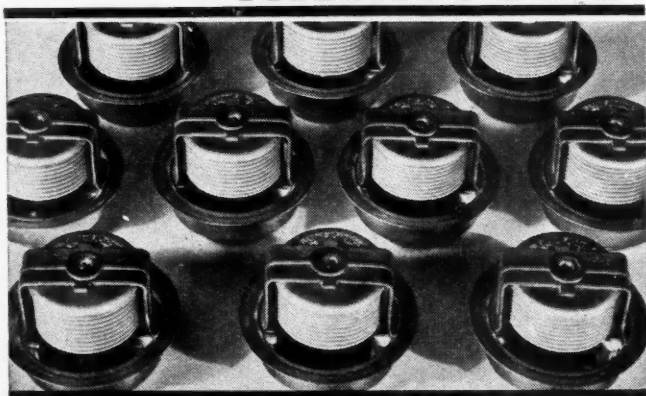
THE "T" TAMES TROUBLE





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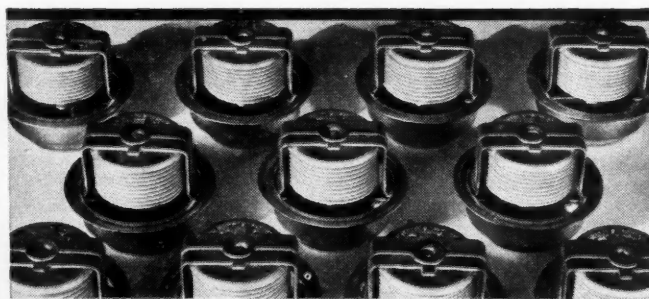


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THE FULTON SYLPHON CO.  
KNOXVILLE, TENN.

# AUTOMOTIVE INDUSTRIES

*THE* AUTOMOBILE

Reg. U. S. Pat. Off.

Published Weekly

October 29, 1938

Volume 79

Number 18

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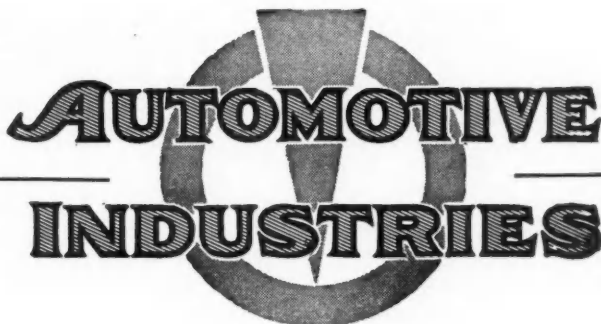
October 29, 1938

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Automotive Industries

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## News of the Industry

### SAFETY FIRST

● "Safety First" as the No. 1 rule in automobile assembly plants now is recognized as both good morals and good management. The point was made by Harry G. Moock, sales vice-president of Plymouth Motor Corp., in an address before this year's National Safety Congress, just concluded in Chicago. Said Mr. Moock, "The automobile industry has succeeded in reducing its injury frequency rate 55 per cent since 1926, and its severity rate 31 per cent in the same period."

● The C.I.T. Indiana Newspaper Seminar of Safety held the attention of Indiana newspapermen for three days last week at Indianapolis. The seminar was conducted by the C.I.T. Safety Founda-

tion, established in 1936 by the Commercial Investment Trust Corp. While two national newspaper seminars had previously been held for newspapermen from all over the country in New York, the three-day meeting marked the first time that a C.I.T. seminar had been conducted exclusively for the newspapers of one state. Dr. Miller McClintock served as Dean of the Indiana Seminar, a similar capacity to that in which he acted at the previous National C.I.T. Seminar. "Three other states," says John W. Darr, vice-president of the Commercial Investment Trust Corp. and trustee of the C.I.T. Safety Foundation, "have made inquiry regarding the possibility of future state Seminars which might aid their own traffic safety programs."

## Production

### Output Rate Continues to Gain With Estimated 70,000 Week

Car and truck production for the week ending Oct. 29 will show another gain over the preceding week, a mid-week survey of factory schedules discloses, although the gain registered will not be as sharp as that of a week ago, when production jumped approximately one-third.

Total for the week is expected to be around 70,000 cars and trucks, which brings the total for October to date almost exactly to the 200,000 mark. With one more productive day in the month October output should register in the neighborhood of 220,000 units. This will make the month the largest in 1938, since January, when 227,230 cars and trucks were turned out, according to U. S. Department of Commerce figures.

The increase this week can be attributed entirely to acceleration of pace by the major producers, particularly Chevrolet, Ford and Plymouth. With extensive rehiring programs now under way in many plants, further increases in production by individual manufacturers have already been announced or are anticipated with the beginning of November. New car sales during the first 10 days in October took an abrupt upturn, according to preliminary figures released by R. L. Polk and Co., which estimates that sales during the period were 14.38 per cent greater than the same period in September. It is expected that registrations for the full month of October will exceed September registrations by a comfortable margin for the first time since 1928 and will mark only the second time that this has occurred in the industry's history. This prediction is borne out by sales figures for the second 10 days in October, released by Buick. This division of General Motors reports 6697 deliveries during the second 10 days of October, a new high for the period.—J. A. L.

### AUTOMOTIVE INDUSTRIES

#### Summary of Automotive Production Activity (Week Ending Oct. 29)

**BUSES** The situation in this field continues unchanged with a few manufacturers encouraged by several important inquiries from their distributors. One prominent producer reports current operations at 42 per cent of capacity, a slowing-down of 8 per cent from last week's tempo.

**TRUCKS** Sales are generally continuing at the same levels as last month. Buyers now awaiting new models and in some instances are delaying purchases to avoid buying license plates for balance of 1938. One of the largest manufacturers in this field reports that deliveries have dropped a trifle this week but attributes the movement to the fact that dealers are getting their houses in order for 1939. All companies appear to be awaiting the National Truck Show in November to feel the pulse of the new year.

**TRACTORS** Inventories seem to be fairly low and companies anticipate a stepped-up production schedule for 1939. General feeling is that 1939 will be a better year than 1938, although probably not as good as 1937.

**AUTOMOBILES** Further gain was registered in production this week, although not as sharp as a week ago when output soared approximately one-third. The AUTOMOTIVE INDUSTRIES estimate for the current week is 70,000 cars and trucks. October output will probably be in the neighborhood of 220,000.

**MARINE ENGINES** It is expected that the biggest display of engines in years will be made at the National Motor Boat Show, Jan. 6-14. The Diesel will play an important part with several new lines of this type of powerplant. Sales in this field are slow because of lack of orders from boat builders. Boat yards in the Great Lakes region are doing very little construction, while building along the Atlantic Coast has been delayed because of extensive reconstruction work required in yards wrecked by the recent storm.

**AIRCRAFT ENGINES** Production of all types of engines continues apace, and research work is being pushed along as rapidly as possible.

*This summary is based on confidential information of current actual production rates from leading producers in each field covered. Staff members in Detroit, Chicago, New York and Philadelphia collect the basic information, in all cases from official factory sources.*

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## News of the Industry

### SEPTEMBER FINANCING FELL

• The dollar volume of retail financing of new passenger automobiles showed a decrease of 61 per cent for the month of September as compared with September, 1937, and a decrease of 62 per cent compared with September, 1936, according to preliminary estimates by the Department of Commerce. As compared with August, 1938, there was a decrease of 21½ per cent.

All percentages presented below are based on daily average figures with each business day of the week weighted according to the relative volume of business as determined by experience in the trade. Allowance has been made for the Labor Day holiday. Comparison of September, 1938, with the same month of previous years and the percentage changes from August to September in past years are shown below.

Comparisons of September, 1938, with the same month of previous years			
per cent	lower	than	September, 1937
61.1	per	cent	1937
62.1	per	cent	1936
38.8	per	cent	1935
34.6	per	cent	1934
28.0	per	cent	1933
40.9	per	cent	1932
22.4	per	cent	1931
42.2	per	cent	1930
68.6	per	cent	1929

August-September changes	
Percentage change from Aug.	September, 1938
1938	-21.5
1937	-16.8
1936	-9.4
1935	-17.1
1934	-16.5
1933	-7.0
1932	-4.3
1931	-11.4
1930	-12.5
1929	-5.1

• Lawrence H. Sloan, vice-president of Standard Statistics Co.; John Darr, vice-president of the Commercial Investment Trust, and James Dalton, editor of *Motor*, will be among the headline speakers at the National Association of Sales Finance Companies' fifteenth annual convention scheduled for Nov. 14 and 15 at the Stevens Hotel, Chicago.

The subject assigned to Mr. Sloan is "Business Profits," while Mr. Darr will speak on "Public Relations of Finance Companies," and Mr. Dalton will discuss "The Dealer, the Manufacturer, and the Finance Company."

Milan V. Ayres, secretary of the association, announced that a session will be devoted to automotive financing, with Clarence L. Landen, vice-president of the Securities Acceptance Corp., Omaha, Neb., as chairman.

Listed for this meeting, along with their subjects, are: William W. McCarthy, vice-president of the Devonshire Financial Service Corp., Boston, "National Card Filing"; P. E. Allen, president Allen & Steen Acceptance Co., Terre Haute, Ind., "Disposition of Repossessed Cars"; D. F. Broderick, president, D. F. Broderick, Inc., Detroit, "Insurance Commissioners' Regulations Affecting Finance Companies"; A. E. Courtney, president, Northern Illinois Finance Corp., De Kalb, Ill., "Sales Tax on Automobiles," and Robert S. Breyer, vice-president, Commercial Discount Co., Los Angeles, "Dealer Relations."

Also scheduled for this session is an open discussion on the subject of "Bank Sales Financing."

### TRUCKS FOR 1939

• Six conventional and six cab-over-engine models powered with General Motors Diesel engines have been announced for 1939 by the General Motors Truck & Coach division. The 12 models cover the gross vehicle range from 35,000

down to 15,000 lb. The GM four-cylinder, two-cycle Diesel with 284 cu. in. displacement and a torque range of 308 to 350 ft.-lb. is used in the GMC 700 and 850 series, designed especially for heavy-duty truck operations. GM's two-cycle, three-cylinder Diesel, which has 213 cu. in. displacement and develops from 230 to 263 ft.-lb. of torque, is offered in the 600 series. GMC's three-cylinder Diesel is also used in the 500 series. A special 440 series, covering both conventional and cab-over-engine models, is intended for straight truck operation on good roads.

• White Motor Co., Cleveland, is bringing out a new house-to-house delivery vehicle for 1939 called the "White Horse." The engine is an air-cooled, four-cylinder airplane type mounted on the rear axle integrally with the clutch and transmission. The complete power unit is removable and interchangeable. White's new truck has a welded all-metal body, completely insulated.

### CASING SHIPMENTS OFF SLIGHTLY

• According to statistics released by the Rubber Manufacturers Association, Inc., shipments of pneumatic casings during the month of September, 1938 are estimated at 3,943,486 units. Although this represents a decrease of 2.5 per cent under shipments made in August, the decline is much less than the usual seasonal drop and September shipments this year were 12.3 per cent over shipments for September, 1937. Larger shipments to the automobile manufacturers helped substantially in maintaining sales volume at its current level this month. Industry sources indicate that while September replacement sales experienced a seasonal decline as compared with August, they were larger than during any September since 1930.

The Association estimates production of pneumatic casings for September at 3,970,397 units, a decrease of 3 per cent below August and 9.4 per cent below September, 1937.

Pneumatic casings in the hands of manufacturers Sept. 30 are estimated at 8,406,261 units. Although stocks on hand were 0.9 per cent greater than on Aug. 31, they were 27.6 per cent less than on Sept. 30, 1937, and it is the belief of many in the industry that stocks are still at an abnormally low level.

### THE PLASTIC AGE

• Plastics, which have been used for years in a limited way in automobile interiors, will be much more in evidence this year and will represent refinements in color harmony to blend with upholstery or exterior finishes. They are being used in steering wheels, horn buttons, face dials for dash board instruments, such as speedometers, clocks, oil and gasoline gauges, heat indicators and ammeters, and as knobs for handles of controls for radios, throttles, chokes and dash board starters. In other parts of the car plastics will be used in some of the new models for fog shields to fit over the headlights, for ornamental radiator caps, for directional signals, for frost shields, and for side curtains in open cars. There is also automotive hardware with plastic handles, such as screw drivers and spark plug testers. According to Howard Ketcham, automotive color consultant, E. I. duPont de Nemours & Co., indications are that plastic will eventually replace chrome in more instances, such as more general use on instrument boards.

## Action At Akron

### Tire Plants Benefit By Upturn In Automobile Production

With replacement tire buying continuing to run ahead of a normal seasonal rate and with original equipment tire specifications of car manufacturers being increased heavily as automobile plants recall many thousands of their employees, Akron rubber goods and tire manufacturers likewise are recalling former employees and reinstating furloughed men, and are stepping up their production tickets. The sudden upturn in the automobile industry is reflected in the increased shift hours in Akron tire plants, and in the subsidiary tire and rubber goods plants of Akron manufacturers. Schedules calling for five and six days of work a week have replaced three-day schedules in many cases. Smaller tire plants which do not supply the original equipment market, have been extremely busy all summer and autumn and see no let-up in their fall production schedules.

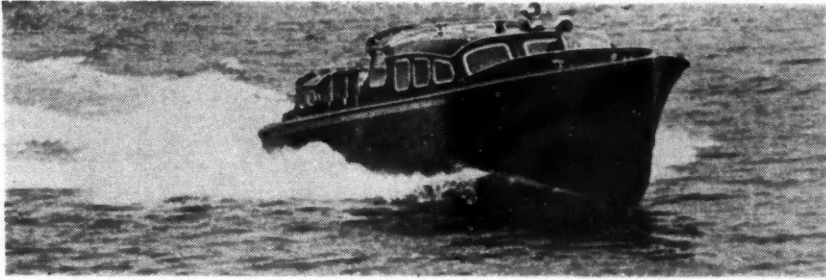
The B. F. Goodrich Akron factories now are employing approximately 8400 compared with 7600 earlier in the summer, with most employees averaging five or six days a week. Firestone reports some rehiring with about 5500 now at work in its Akron plants and tire production schedules considerably heavier than in the summer. Goodyear re-employment has been "spotty" and counter-balanced by recent layoffs. The company's Akron factories now have about 7000 employees. Branch plants of these three major Akron firms at Gadsden, Ala.; Cumberland, Md.; Jackson, Mich.; Cadillac, Mich.; Memphis, Tenn., and in California are reported to be operating nearly at capacity.

## To Make Wage War

### "Shooting for 40-Cent Minimum."

#### Says URW Vice-President

Returning to Akron from a conference in Washington with Elmer F. Andrews, Federal wage-hour administrator, Thomas Burns, vice-president of the United Rubber Workers Union of America, has announced that the URW will launch an immediate and aggressive campaign to have a 40-cent hourly minimum wage set throughout the rubber and tire industry. Burns said he was told in Washington that an advisory committee for the rubber industry, to consider establishment of a minimum



### FORD V-8 ENGINES

power this new express cruiser which will be used by Their Majesties, King George and Queen Elizabeth of England, with the Royal yacht *Victoria and Albert*. The 40-ft. speedboat is equipped with three engines which are marine conversions of Ford V-8 industrial units and is capable of making speeds in excess of 20 knots. Two of the engines are used in maneuvering and all three in straight running.

above the first year level of 25 cents set in the wage-hour law, probably would be named about Feb. 1.

"We're shooting for a 40-cent minimum," said Burns. "While the industry generally is paying more than that already in Ohio, there are plants outside of Ohio paying less than 25 cents an hour."

Burns said there were numerous low-wage rubber plants in the South, and indicated that the union's drive for a 40-cent hourly minimum would have as its underlying motive, an equilization of wage rates to prevent further transfer of Akron rubber and tire goods production to the South. Goodyear has a large plant at Gadsden, Ala., and Firestone has a new and rapidly growing tire plant in Memphis, Tenn. Rumors have been current in Akron that Firestone might sell its Akron factories to Goodrich and make Memphis its manufacturing hub in the near future.

## Urges Building of Express Highways

*Needed Not Only for Economic Reasons But as a Safety Factor Says V. G. Iden, Secretary of American Institute of Steel Construction*

Declaring that the greatest need today in highway building is to construct express highways that will carry motor traffic through congested centers, V. G. Iden, secretary of the American Institute of Steel Construction, told the United States Chamber of Commerce industry conference in Washington, D. C., last week that the few samples of elevated highways already constructed demonstrate the economy and efficiency of such through roads. Delay in building more highways of this character was held to be "probably due" to inability of the cities alone to finance the improvements. Because car owners living in cities are already paying the bulk of automobile taxes collected by both the state and Federal

Governments, Mr. Iden said it is unfair to expect the cities to assume full responsibility of financing such highways. Mr. Iden urged construction of such highways not only for economic reasons, but also as a safety factor, asserting that at least 75 per cent of all accidents in Urban areas are accidents against pedestrians. This class of accident, he said, would be eliminated entirely by elevated highways.

From the point of economics, Mr. Iden said that business establishments are moving out of the cities to escape congestion. To traffic congestion was attributed promotion of chain stores, and chain banking as well as further changes in doing business. These changes, Mr. Iden said, are making social life more complex and more expensive.

The manufacturers of automobiles were declared to be keenly alive to the problem because city congestion is threatening to curtail their markets for automobiles, while the petroleum industry was said to be equally as concerned because of the threat to its markets.

"The construction industry," said Mr. Iden, "should give it careful study, because it means a volume of work the like of which could only be equaled by our skyscraper-building era."

The American Institute of Steel Construction, Mr. Iden said, in order to arouse the imagination of architects and engineers last year, offered prizes for the best-looking design for an elevated highway that could be built through the streets of an ordinary city, and called attention to some outstanding designs on display in the chamber. The automobile manufacturers, he stated, are planning to show samples of elevated highways at the New York World's

(Turn to page 520, please)

*Passenger Car Production by Wholesale Price Classes  
(U. S. and Canada)*

Nine Months 1938 and 1937 Compared

	Nine Months		Per Cent Change	Per Cent of Total	
	1938	1937		1938	1937
Under \$750.....	1,097,426	3,053,864	- 64.0	87.38	95.60
\$751-\$1000.....	139,478	106,451	+ 31.0	11.11	3.33
\$1001-\$1500.....	15,128	23,664	- 36.0	1.21	.74
\$1501-\$2000.....	2,320	8,182	- 71.6	.18	.26
\$2001-\$3000.....	1,242	2,299	- 45.9	.10	.07
\$3001 and over.....	275	130	+111.0	.02	
Total.....	1,255,869	3,194,590	- 60.6	100.00	100.00

*Truck Production by Capacities*

(U. S. and Canada)

Nine Months 1938 and 1937 Compared

	Nine Months		Per Cent Change	Per Cent of Total	
	1938	1937		1938	1937
1½ Tons and less.....	358,424	710,057	- 49.5	92.58	93.45
2 to 3 Tons.....	14,831	29,867	- 50.3	3.83	3.93
3½ Tons and over.....	6,984	10,289	- 32.3	1.80	1.35
Special and buses.....	6,927	9,677	- 28.5	1.79	1.27
Total.....	387,166	759,890	- 49.0	100.00	100.00



## News of the Industry

### WHAT ARE THEY DOING?

**JOHN SCOVILLE**, economist for the Chrysler Corp., has accepted an invitation to address the 1938 Ohio Conference of Statisticians on Business Research. The conference will be held at the Ohio State University on Nov. 12.

**A. DiGIULIO**, formerly research metallurgist for Ford Motor Co., has been appointed Assistant Professor of Metallurgy, University of Detroit.

**HOWARD F. MacMILLIN** has been elected president of the Hydraulic Press Mfg. Co., Mount Gilead, Ohio, to succeed his father, F. B. MacMillin who died Sept. 8, 1938. For the same company, **H. A. TOULMIN, JR.**, of Dayton, was elected a director to fill the unexpired term of Mr. F. B. MacMillin.

**FRANK MALCOLM FARMER**, vice-president and chief engineer of the Electrical Testing Laboratories, New York, has been reelected chairman of the Engineering Foundation. **GEORGE E. BEGGS**, professor of civil engineering at Princeton University, was elected vice-chairman. **J. H. R. ARMS** will continue as secretary and **OTIS E. HOVEY** as director. The executive committee is headed by Mr. Farmer. Other members are **A. L. J. QUENEAU**, metallurgist of the United States Steel Corp.; Professor **W. I. SLICHTER** of Columbia University; **K. H. CONDIT** of the National Industrial Conference Board, New York, and Professor Beggs. The following will serve as chairmen of the committees during 1938-1939: research procedure committee, **MR. COLCORD**; iron alloys committee, Professor **GEORGE B. WATERHOUSE**, Massachusetts Institute of Technology; welding research committee, **COMFORT A. ADAMS**, consulting engineer with E. G. Budd Mfg. Co.

**WILLIAM P. WINSLOW** has been appointed manager of the Pontiac Zone for the Pontiac Motor Division of General Motors Corp. He succeeds **JAMES A. GRIER**, whose recent promotion to the position of manager of the Central Region followed the resignation of **A. A. KLEIN**, who took over the Pontiac dealership in New Orleans, La. **LANSING W. THOMS** has been named as successor to Winslow as zone manager at St. Louis.

**T. D. CARTLEDGE**, formerly assistant general sales manager, has been appointed general sales manager of the Linde Air Products Co., a unit of Union Carbide and Carbon Corp.

**J. N. WALKER** has been elected vice-president of Oxweld Acetylene Co., a unit of Union Carbide and Carbon Corp., New York. Mr. Walker has been general sales manager of the Linde Air Products Co., also a unit of Union Carbide and Carbon Corp.

**L. E. GANNON**, advertising manager of Palmer-Bee Co., Detroit, has been elected secretary-treasurer of the Industrial Marketers of Detroit, a chapter of the N.I.A.A. Palmer-Bee Co., Detroit, has issued a 48-page book illustrating manufacturing facilities, products and installations relating to its line of power transmissions, materials handling machinery and fabricated steel.\*

**FRED HASTINGS** has been appointed sales manager of the Pak-Age-Car Corp., Connersville, Ind. For the same corporation, **A. R. GRIBBEN** has been named assistant sales manager.

### PUBLICATIONS AVAILABLE

Circular G-422, issued by Cincinnati Milling Machine & Cincinnati Grinders,

Inc., Cincinnati, Ohio, describes Willey's tungsten carbide work support blades for the company's Nos. 2, 3, and 4 centerless grinding machines.\*

**B. F. Goodrich Co.**, Akron, has published an operators' handbook on truck, bus, and farm and industrial tractor tires.\*

"How to Repair Concrete to a Feather Edge," is the title of a pamphlet published by the Flexrock Co., 300 N. Delaware Ave., Philadelphia.\*

A folder illustrating the use and design of Rex apron conveyors has been brought out by the Chain Belt Co., Milwaukee, Wis.\*

**Joseph T. Ryerson & Son, Inc.**, Chicago, has issued a condensed steel stock list and data book which contains an explanation of the change in steel classifications and extras, general data tables of interest to steel users.\*

Research bulletin No. 62 entitled "Adhesion of Bituminous Films to Aggregates" has been published by the Engineering Experiment Station of Purdue University.\*

Most recent literature brought out by the New Jersey Zinc Co., New York, comprises two bulletins on the use of zinc die castings in "Industrial Equipment" and in "Hardware."\*

**Torrington Mfg. Co.**, Torrington, Conn., has issued another pamphlet which sets forth the features of its new torsion spring winding machines.\*

\* Obtainable from editorial department, AUTOMOTIVE INDUSTRIES. Address Chestnut and 56th Sts., Philadelphia.

### UAW "COOPERATING"

● As a gesture of goodwill and to promote sales of Studebaker cars in South Bend, Ind., and vicinity, Studebaker local union No. 5 of the United Automobile Workers has planned an advertising campaign urging all merchants and citizens to buy Studebaker cars. The campaign will extend over some time, the union carrying a half-page advertisement in both the *News-Times* and *Tribune* every two weeks. The first one appeared Sunday, Oct. 16, the second will appear Oct. 30. The union, of 7000 members, suggests that those who expect patronage of the union should buy their pleasure and commercial cars from Studebaker.

### PRICES: 1939 MODEL'S

● Chevrolet has announced price reductions affecting its entire 1939 line. Amount of reduction amounts to as high as \$45, on the Master DeLuxe sport sedan. Delivered prices at Flint, Mich., exclusive of transportation and state and local taxes, are as follows: Master DeLuxe Series: Sport Sedan \$766; Sedan \$745; Town Sedan \$720; Four-passenger coupe \$715; Coach \$699; Business coupe \$664. Master 85 series: Sport Sedan \$710; Sedan \$689; Town Sedan \$669; Coach \$648; Business coupe \$628; Coupe pick-up \$669; Sedan delivery \$673.

● Hupp Motor Car Corp. has announced prices on its senior models for 1939, deliveries to begin Nov. 1. The senior line of 1939 Hupmobiles comprises a 122-inch wheelbase, six-cylinder, six-passenger sedan and a 125-inch wheelbase, eight-cylinder, six-passenger sedan, both lines available in DeLuxe and Custom models. The 1939 DeLuxe Big Six will deliver completely equipped in Detroit for \$995. The custom model, which includes additional accessory groups, will deliver in Detroit for \$1095. The DeLuxe Eight will deliver completely equipped in Detroit for \$1145, while the custom model, with additional accessories, will deliver for \$1245. These prices do not include the state sales tax. They represent a reduction from 1938 prices of from \$50 to \$160.

## Another Dodge Plant

### Detroit Truck Factory Completed; Capacity for 700 Units Daily

Completion of a mammoth new Dodge truck factory was announced this week by J. D. Burke, director of Dodge truck sales. The plant is part of a \$6,000,000 commercial car manufacturing and sales program on which the Dodge division of Chrysler Corp. is said to be embarking. The plant will be devoted to the building and manufacturing of commercial vehicles ranging from one-half ton to three ton capacities, with facilities for 700 units per day. It has a total floor space of 693,163 sq. ft., occupies 49 acres of ground and is located northwest of Detroit on Mound and Eight Mile Roads in Macomb County.

The plant's 50 conveyors extend a total distance of nearly seven miles. The most modern painting equipment in the industry has been installed. All sheet metal will go through a rust proofing process. All booths are of the latest hydro-filter type which provide an abundance of fresh air for workers.

## Ford Trucks for '39

### Forty-Two Body and Chassis Types In Line; Have Hydraulic Brakes

Forty-two body and chassis types, two clutches, five transmissions and eight rear-axle ratios, in addition to various wheel and tire sizes have been announced for the 1939 line of Ford V-8 trucks and commercial cars equipped with hydraulic brakes.

The 112-in. wheelbase chassis has wide applicability through use of the 85 and 60 hp. engines, three transmissions and three rear-axle ratios. A 4.44 to 1 rear-axle ratio is used with the 60-hp. engine and a 3.78 to 1 rear-axle ratio with the 85-hp. engines. An optional rear-axle ratio of 4.11 to 1 is also available.

There is a choice between the low reduction three-speed transmission ordinarily used with the 60-hp. engine and the standard three-speed transmission ordinarily used with the 85-hp. engine. There is also a four-speed transmission. The chassis is available with panel, stake, platform, pickup, sedan delivery bodies, as chassis with cab and in two driveaway types.

A list of selections also prevails for the 122 in. wheelbase one-ton truck. It is available with the 60-hp. engine and a 6.67 to 1 rear-axle ratio and the 85-hp. engine with a 4.86 to 1

rear-axle ratio. A heavy duty four-speed transmission or either of two special three-speed transmissions may be used with the 85-hp. engine and a four-speed transmission with the 60-hp. engine.

The one-tonner is available with panel, express, stake and platform bodies, as chassis with cab and in two driveaway types.

A choice of either the 85 or 95-hp. engine is available with the 134-in. wheelbase and 157-in. wheelbase conventional trucks and all cab-over-engine trucks.

There is also a choice between rear-axle ratios of 5.14 to 1, 5.83 to 1, and 6.67 to 1. If still lower reductions are desired, a two-speed axle is offered with dual ratios of 8.11 to 1 and 5.83 to 1.

The conventional 134-in. wheelbase chassis is available with panel, stake and platform bodies, as cab and chassis and in two driveaway types. The 134-in. wheelbase dump chassis is available with dump body, as cab-and-chassis and in two driveaway types. A 191-in. wheelbase chassis for school bus use is available in a driveaway type.

The 157-in. wheelbase chassis is available with stake and platform body, as cab and chassis and in two driveaway types.

Introduced last spring, the line of Ford cab-over-engine trucks has been expanded by the addition of a 157-in. wheelbase unit. It is available as chassis with cab, and in a driveaway type.

The 134-in. wheelbase cab-over-engine chassis is available with stake and platform body, as chassis with cab and in two driveaway types.

The 101-in. wheelbase cab-over-engine chassis is available with dump, stake and platform bodies and in a driveaway type.

Improved front end styling features the conventional truck types and commercial cars.

## How "Red" Is The UAW?

*Witnesses Testifying Before Dies Committee Claim That Union is "Shot Through With Communism"*

Graphic recitals alleging that the United Automobile Workers Union is shot through with Communism and is Red-dominated were presented last week before the Dies Committee Investigating un-American Activities. The basis for the testimony chiefly was centered around the union's activities in the automobile industry. Witnesses, including one judge, police officials and former members of the UAW made charges against Gov. Frank Murphy of Michigan for refusal to enforce the law against strikes, while in one instance, it was alleged that an attache of the National Labor Relations Board asked a former member of the union to join the Communist party, a charge which the NLRB denied in a telegram to the committee.

There was a touch of humor associated with the incident. Ralph Knox, former UAW organizer, who made the charge, followed up the denial of the NLRB representative with a telegram to the committee on Tuesday of the present week offering to take a truth serum to prove that he was telling the truth. He suggested that the Labor Board representative, Benedict Wolf, former NLRB attorney, be subjected to the same test. Knox had said the name of the Government official was "Ben Wolf" or "Ben Wood," not being certain which was correct.

President Homer Martin of UAW was to testify to disclaim charges against the union, but his appearance before the committee was postponed owing to illness. He is expected to appear at an early date.

Superintendent of Police Fred W. Frahm of Detroit, who expressed the opinion that 75 per cent of the

strikes in that city in the past two years had been inspired by Communists, predicted that unless the union can get the Communist element out before long there "will be an awful clash." In his story the Detroit police chief said it is often impossible to find out who starts strikes, "as, for example, those at the Plymouth plant, where there has been about one a week." But, he said, the Communists "are usually in the lead."

It was difficult for employers to throw out Communist employes because they hid under the cloak of unions which were protected by the National Labor Relations Board, the committee was told by John W. Koos, Ford Motor Co. service department employe and attorney.

Ninety-two officials of the UAW were named as Communists by Knox, who was ousted by Homer Martin as president of the union's largest local in Detroit.

In a telegram to the committee, Harold Cranfield, of the NLRB, attacked testimony of William Gernaey, formerly employed by the Corporation Auxiliary Co., of Cleveland. Gernaey had connected Cranfield, formerly an investigator for the LaFollette Civil Liberties Committee, with Communism. Cranfield declared Gernaey's statements were "utterly falsified."

Mr. Dies has announced that he had decided to ask the Labor Department for complete files on 3000 aliens who are, it is charged, subject to deportation, which, he said, is mandatory.

Governor Murphy was sharply attacked by Judge Paul V. Gadola, of the Genesee County Circuit Court of Appeals at Flint, Mich., and John M. Barringer, former city manager of Flint. Judge Gadola, attacking the Governor's sit-down strike tactics, said Mr. Murphy prevented execution of an order issued by the judge to oust strikers from Fisher body plants at Flint. Mr. Barringer bluntly declared that Mr. Murphy was "guilty of treasonable action in not giving us help when we asked for it." Mr. Barringer was ousted by his own council after the strike because he called "reserves," or "vigilantes," as the council called them.

Agents for the LaFollette Senate Civil Liberties Committee were held

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### FORD FOR

'39—A member of the new line is this cab-over-engine dump truck with 101-in. wheelbase chassis. It is available with either the new 95 hp. engine or the improved 85 hp. engine. For details of complete line see article on opposite page.



## News of the Industry

### GOVERNMENT CONTRACTS

● Public Contracts Board reports Government contracts for transportation equipment for the week ended Oct. 15 totaled \$8,224,471.68. The awards were:

Goodyear-Zeppelin Corp., Akron, Ohio, fins & elevators, \$11,625.00. Wright Aeronautical Corp., Paterson, N. J., castings, \$15,320.58. United Aircraft Corp., Pratt & Whitney Aircraft Div., E. Hartford, Conn., aircraft bearings, \$10,187.18. United Aircraft Corp., Pratt & Whitney Aircraft Div., E. Hartford, Conn., Aircraft bearings, \$10,582.65. Koppers Co. (American Hammered Piston Ring Div.), Baltimore, Md., piston rings, \$14,484.24. United Aircraft Corp., Pratt & Whitney Aircraft Div., E. Hartford, Conn., engine parts, \$83,674.34. United Aircraft Corp., Pratt & Whitney Aircraft Div., E. Hartford, Conn., engine parts, \$16,540.60. Wright Aeronautical Corp., Paterson, N. J., engine parts, \$151,550.42. Wright Aeronautical Corp., Paterson, N. J., engine parts, \$16,260.67. Pump Engineering Service Corp., Cleveland, Ohio, pump assemblies, \$25,365.00. General Motors Corp., Cleveland Diesel Engine Div., Cleveland, Ohio, propelling machinery, \$2,583,000.00. Fairbanks, Morse & Co., Chicago, Ill., Beloit, Wis., propelling machinery, \$2,880,801.00. American Locomotive Co., New York City, propelling machinery, \$1,746,000.00. Fairbanks, Morse & Co., Chicago, Ill., propelling machinery, \$567,611.00. International Harvester Co., Inc., Washington, D. C., Springfield, Ohio & Ft. Wayne, Ind., trucks, \$11,120,000. Palace Travel Coach Corp., Flint, Mich., trailer, \$68,633.00. Figueroa & Gautier, San Juan, P. R., General Motors Corp., Detroit, Mich., truck chassis & sedans, \$11,716.00.

Miscellaneous awards were:

Greenfield Tap & Die Corp., Greenfield, Mass., gages, \$10,867.00. Sperry Gyroscope Co., Inc., Brooklyn, N. Y., Remington Rand, Inc., Washington, D. C., directors office equip., \$30,570.00. Standard Oil of N. Y., Div. of Socony-Vacuum Oil Co., Inc., Boston, Mass.; Socony service stations in the States of Maine, Mass., R. I., N. Y., N. J., Conn., N. H., Vt. & Pa., gasoline, oil, anti-freeze, lubrication service, \$17,333.00.

### GERMANY-SWITZERLAND-SWEDEN

● The four German national prizes in the arts and sciences (established to replace the Noble prizes which Germans are no longer permitted to accept) were this year awarded to four men closely connected with the transportation industries, viz., Dr. Ing. Ferdinand Porsche, well-known automobile engineer and designer of the Volkswagen; Dr.-Ing. Fritz Todt, in charge of Autobahn or super-highway construction, and Dipl.-Ing. Prof. Willy Messerschmidt and Prof. Dr.-Ing. Ernst Heinkel, both prominent aircraft designers.

● The new German airship Graf Zeppelin has been christened (with liquid air) at Friedrichshafen recently by Dr. Eckener. It will be inflated with hydrogen, but the fire risks have been reduced by condensing the water of combustion in the exhaust gases, so that it is not necessary to "valve" hydrogen to decrease the buoyancy as the fuel supply is used up. The gas capacity of the new ship is 7,060,000 cu. ft., as compared with the 5,500,000 of the Hindenburg. The ship is a little over 800 ft. long and of 135 ft. maximum diameter. It is equipped with four Daimler-Benz Diesel engines of about 800 hp. cruising output each and has a cruising speed of 80 m.p.h. The total lift is approximately 200 metric tons.

● To Dr. Ernest Guglielminetti, a Swiss country doctor who is said to have invented the tarred road, the town of Brique,

Switzerland, has awarded its highest distinction, "honor citizenship." Dr. Guglielminetti's first experiments with the use of tar as a road surfacing material were conducted in March, 1902, at Monte Carlo under the auspices of the Prince Albert of Monaco. Like many pioneers, the doctor met with vigorous opposition in his early attempts to introduce the idea because the tar first used was injurious to roadside vegetation.

● Reports to the Commerce Department indicate that the Swedish Cooperative Union is convinced it is better to purchase agricultural machinery in the United States rather than to manufacture it in Sweden. Indicative of this trend is the recent purchase by the Union of 50 tractors of United States manufacture. The American Consulate General in Stockholm reports that anticipations are that annual purchases of American farm equipment on a large scale will be made in the future, involving possibly millions of crowns.

### CALIFORNIA RANKS HIGH

● Though far from the automotive industry's main manufacturing centers, California ranks high in that field and is making greater gains year by year, according to figures in a report received by the California State Automobile Association. In this state approximately 342,000 persons are regularly employed in the industry, a figure exceeded only by Michigan, New York and Pennsylvania.

From California the industry gets petroleum, lumber, chromium, mercury, platinum, gold, silver and zinc.

### OUR NEIGHBOR TO THE NORTH

● Motor vehicle licenses issued in Canada in 1937 numbered 1,319,702, an increase of 57,573, or 6.4 per cent over 1936. These figures indicate the popularity of the automobile in the Dominion of Canada and it is estimated that there is one private passenger car to every 10.1 persons, or if trucks and buses are included, one motor vehicle to every 8.4 of the population of Canada. In 1937 there were 1,097,546 private automobiles in operation, 5466 taxi cabs, 200,729 trucks, 11,102 motor cycles, 2320 buses and 2539 motor vehicles.

● Ross Mackinnon, vice-president of Hudson Motors of Canada, Limited, Tilbury, Ont., at a recent pre-view conference of 1939 models stated, "Hudson's program of increasing manufacturing facilities at Tilbury, Ont., have been materially extended, and our 1939 production is getting under way immediately. Based on reports from our distributors in all parts of the Dominion of Canada, indications for retail sales are excellent."

### MOVING THE EARTH

● First major Pacific Coast sale of the Tournapull, new two-wheeled high-speed earth-moving machine recently brought out by R. G. LeTourneau, Inc., San Francisco, Calif., was announced last week when release was made of an order received for 10 units to be used on the \$5,500,000 Hansen dam project in Los Angeles. The Tournapull combines a tractor and scraper capable of large dirt capacity and high speed. Powered by a 160 hp. Caterpillar Diesel engine, the machine will handle up to 50 cu. yd. of earth at top speed of 20 m.p.h. LeTourneau is said to be considering production of a similar tractor-scraper combination in a smaller size than the Tournapull.

## Automotive Abstracts

### Special Sections For All-Steel Bus Bodies

The type of construction employed in modern all-steel passenger-car bodies is not adapted for use in bus bodies, because the pressings required would be too large and the number of bodies of a given model required is too small. It is possible, however, to build all-steel bus bodies by making use of special profiles or sections in building up a skeleton frame, which is

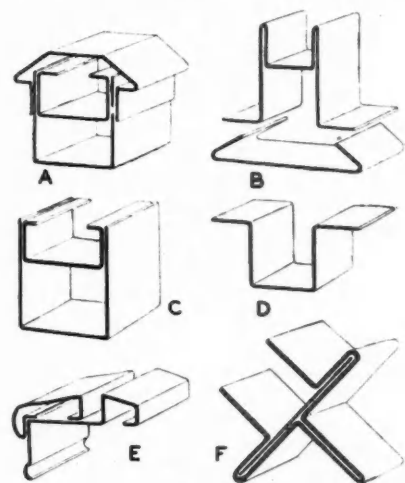


Fig. 1—Special sections for truck and bus bodies

later covered with an outer shell of sheet steel or sheet aluminum. Such a body has almost the same advantages as the passenger-car all-steel type. These include lower weight and greater rigidity and longer life than a wooden frame; simple and relatively cheap production, reduction in maintenance cost, as the steel frame better withstands road shocks and vibration; elimination of noise by suitable jointing meth-

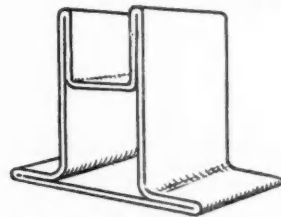


Fig. 2—Profile for a bus body post.

ods, and greater safety in the event of collision; reduced fire hazards, and greater facility of export as the completely fabricated special sections can be packed very compactly.

This special type of body construction is based on special sections for the vertical posts, horizontal sills, and the diagonal braces, in addition to sections for the steps

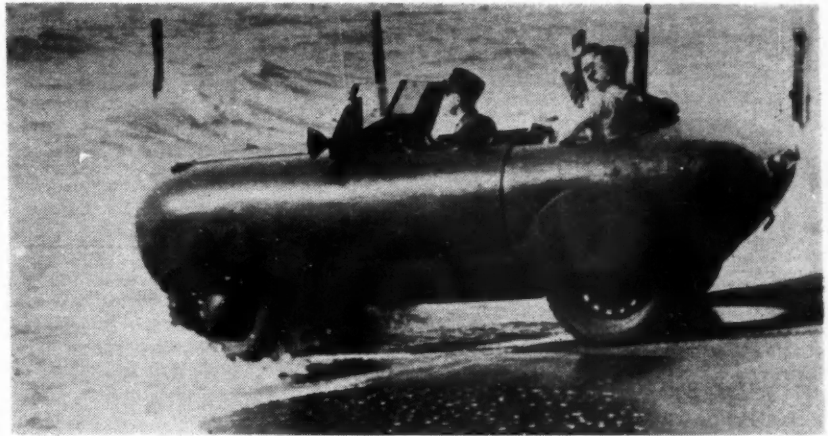


or running boards, drip moldings, and window frames. The illustrations herewith are of special steel sections furnished for this purpose by Accles & Pollock, Ltd., Birmingham, England.

The sections are made of polished cold-rolled low-carbon steel. On special order the firm furnishes these sections also in hot-rolled steel, pickled; in stainless steel, brass or other non-ferrous materials. In the case of materials other than the cold-rolled steel, the sections are made of strip, the strips being formed into the various sections by rolling while cold through profile rolls. This method is adapted only for quantity production, as a set of rolls have to be made for each different profile. This method of fabrication permits of shaping the members without loss of strength; in fact, the cold work slightly increases the tensile strength and the notched-bar test value. Strips of  $\frac{1}{4}$  in. to 14 in. width and from 0.005 to 0.125 in. thickness can be fabricated in this way.

In assembling the frame it is necessary to drill or punch holes in the sections, to counterbore them and form the ends. Joints are made either by riveting, bolting, spot-welding or arc-welding. The last two methods have become particularly popular recently.

Fig. 1 shows a number of special sections for truck and bus bodies, viz., A, a cross section of a post for a bus body, the post being made in three parts; B, post of special design, in two parts; C, main cross member for a bus body, two parts; D, roof girder; E, profile for a fixed window for a bus body; F, special section for body post, two parts. Fig. 2 shows a profile for an omnibus body post which is similar to B in Fig. 1 but rolled in a single piece. —ATZ, Sept. 10.



**AMPHIBIAN** motor car said to be equally at home on land or on water. It has been demon-

strated in Rome by its inventor, Captain Trippel, a German. The car is shown entering the sea at Ostia, near Rome.

## Will Britain Cut Duty on U. S. Cars?

*Reports Indicate That United States and England May Negotiate Reciprocal Tariff Agreement*

The United States and the United Kingdom are expected to smooth out reported differences and to negotiate a reciprocal tariff agreement with satisfactory British duty concessions granted on American automobiles. This belief is largely prevalent despite published reports that the two countries had reached a serious impasse. These reports had it that the negotiations had been halted by refusal of the United Kingdom to grant request of the United States for reduction of duties on automobiles, lard, ham, bacon, etc., on a parity with those allowed British dominions.

There is a belief that these reports are partially correct and that the United Kingdom has been hesitant about making certain requested duty concessions. Nevertheless, it is doubted the United Kingdom is objecting to reduction in duties on the

smaller American cars, as reported.

It is believed that, if the United Kingdom is holding off on reducing such duties, it is not because of objection to concession to American car importations, but rather the fear that the same duty would have to be automatically applied to other countries under Britain's most-favored-nation treaties, from which rising imports of the lower priced cars has been a source of considerable complaint. It is well known that there has been a sharp upturn in shipments of cheap German cars to the United Kingdom, and it is recalled that Germany now is preparing to put a still cheaper car on the market—the Volkswagen.

There are reports that, if automobiles are among items on which the United Kingdom is temporarily withholding concessions it is because of difficulty of finding a way by which they can be granted American cars without extending the same lowered duties to other non-British countries. One suggestion has it that the difficulty, if it prevails at all, may be worked out by applying the more favorable duty on a basis of specifications rather than on an ad valorem basis—such as by weight, horsepower, engine bore, such as would cover American but not other cars.

For some of the lower priced American cars the matter of reduced British duties would be of no importance, except possibly for a temporary period, since they have their own manufacturing plants in England.

## Automotive Metal Markets

*Little Fresh Business in Steel Expected During Early November Due to Heavy Tonnages Booked by Mills at Old Price Levels*

Only when the time for covering next year's initial requirements rolls around, will it be possible to appraise the effect which the recent price upheaval is likely to have on the steel market's future course. To what extent automobile manufacturers and parts makers were able to provide their flat steel requirements over the next two months at prices \$4 to \$6 below those now quoted, is prob-

lematical.

Market gossip has it that some large automotive buyers have covered their November-December requirements in full at these lower prices. Stoutly denied by steel company sales managers are rumors that in some cases buyers were able to obtain "options" or price protection at these levels for their needs over

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## News of the Industry

### ADVERTISING NEWS NOTES

- The Aitkin-Kynett Co. has announced its resignation from the account of Hyvis Oils, Inc., and simultaneously reports its appointment as advertising agent for the Wolverine-Empire Refining Co.
- Glen Bannerman, advertising manager of Hudson Motors of Canada, Ltd., Tilbury, Ont., was recently elected president of the Association of Canadian Advertisers at their annual convention held in Toronto city.
- Charles S. O'Donnell has been elected a director of the J. M. Mathes, Inc., New York advertising agency, which he joined in 1934. He was previously associated with the Graham-Paige, Ford, and Lincoln accounts. Mr. O'Donnell is in charge of the agency's marketing research division.
- E. F. Millard, advertising manager of the Ford Motor Co. of Canada, Ltd., Windsor, Ont., at the recent annual meeting of the Association of Canadian Advertisers was elected as one of the directors of this body.
- Acme Machinery Co., Cleveland, has doubled its advertising appropriation for the coming year. John Stephen is handling the account.
- The new Sky Chief gasoline, a companion to Fire Chief, is being promoted by Texaco Co. through Newell-Emmett Co., and the "insulated Havoline" and "insulated Texaco" are being promoted for the company by Erwin, Wasey & Co.
- C. B. Watt, advertising manager General Motors of Canada, Ltd., Oshawa, Ont., has been elected as one of the vice-presidents of the Association of Canadian Advertisers, Toronto, Ont.

### FARM EQUIPMENT EXPORTS DOWN

- Exports of farm equipment in September were valued at \$6,434,837 or 9 per cent lower than the September, 1937, shipments valued at \$7,074,986, the Machinery Division of the Department of Commerce reports. All of the major types of equipment, except threshers, plows and fuel injection type tracklaying tractors, shared in the smaller volume of business.
- Threshers exported during the month were valued at \$102,111 as against \$68,997 a year ago. Plows were valued at \$284,841 compared with \$215,605 last year. A 21 per cent increase was registered in the exports of tracklaying tractors of the fuel injection type, which were valued at \$1,130,498 as compared with \$936,824 last year.
- Tractors, parts, and accessories valued at \$4,573,853, accounted for 71 per cent of our total farm equipment export trade during September. The value of this trade was 11 per cent below that for September, 1937, of \$5,146,074, reduced shipments being made in both wheel tractors and tracklaying tractors of the carburetor type.

### VIEWPOINTS ON LABOR SYSTEMS

- The fundamental difference between the American and British systems of labor relations is that in this country we try to do everything by written law, which, at best, is frequently unsatisfactory because of the complexity of the subject which the law is designed to cover. In England, on the other hand, industrial relations have grown up by custom into a very definite plan of procedure, which is free, to a very large part, from either government supervision or government interference. In fact, both employe and employer in England have made it a fixed policy to keep the gov-

ernment out of their problems, rather than to encourage the government, as has been done in this country, to take an active part in labor matters. The foregoing statements were made by J. A. Voss, director of industrial relations, Republic Steel Corp., before the fifteenth annual convention of the National Association of Foremen, held recently in Akron, Ohio.

- John C. Gall, counsel of the National Association of Manufacturers, remarked in a speech made last week that, "Those who approve and applaud the British system of industry-wide collective bargaining and urge its adoption should, to be consistent, agree to two fundamental prerequisites which prevail there. These are, first, a minimum of governmental interference in the employment relation, and, second, absolute impartiality of treatment of employers and employees and their respective organizations by the government and all its agencies. This means, translated into terms which we all understand, that the National Labor Relations Act should be changed in important particulars to produce that impartiality which lies at the base of British employment relations."

### 40 Years Ago

- Those who were present at the *Times-Herald* race, at Chicago, in November, 1895, will recall the Hertel motorcycle, a light vehicle, the main frame of which was made by joining two bicycles together at a sufficient distance apart to afford seating capacity . . . from it has grown a light road carriage, weighing only about 500 pounds, capable of highest speed, and propelled by a jacketless gasoline motor. The motor is horizontal and has two cylinders and develops about 3 hp.

From *The Horseless Age*, October, 1898.

### THE AIRCRAFT FIELD

- Douglas Aircraft Co., Los Angeles, Calif., has declared a common dividend of \$3 a share payable Nov. 24 to stock of record Nov. 4. This is the first payment since September, 1935, when 75 cents was distributed.

For the first nine months of the company's fiscal year profit was \$1,821,964, or \$3.19 a share, compared with \$852,795, or \$1.49, for the same period of 1937.

- A certificate of incorporation has been granted to the newly-formed Allied Aircraft Corp., Buffalo, N. Y., incorporated at \$225,000. The company is expected to build training planes to sell in the low-priced field. A factory site is being selected.

- Douglas Aircraft Co. has received an order from the American Airlines, Inc., for five additional 21-passenger planes. Total cost of the planes is \$573,890 and delivery is to be made next March. Anticipation of increased travel next summer to the New York World's Fair and the Golden Gate Exposition is a factor in the equipment purchase.

- Having passed all flying tests satisfactorily the \$2,000,000 Douglas DC-4, world's largest airplane, is being fitted out for its first airlines use. Test equipment will be removed from the ship's interior and accommodations for 42 passengers and a crew of five installed.

### Hudson Reveals Further Details Of Its 1939 Line

Supplementing information already published, the Hudson Motor Car Co. calls attention to some additional details in connection with its 1939 plans, which include the presentation of three new lines of cars, all bearing the Hudson name. The cars are correctly designated as follows: The Hudson 112 in the lowest price field, with 86 hp., mounted on 112-in. wheelbase; a new Hudson Six in the low price field with 96 hp., mounted on 118-in. wheelbase, and a new Country Club series with both six and eight-cylinder engines giving, respectively, 101 and 122 hp., mounted on 122-in. wheelbase; and a special eight-cylinder Custom Sedan on 129-in. wheelbase, in the moderate price field. Also included are 1/2-ton capacity business cars on the 112-in. chassis, and 3/4-ton capacity on the 96 hp. chassis with 119-in. wheelbase.

### How "Red"?

(Continued from page 515)

by Mr. Barringer to have been largely responsible for the acuteness of the strike situation.

President Roosevelt issued a tart statement on Tuesday attacking the Dies Committee in which he warmly defended Governor Frank M. Murphy of Michigan, against charges of "treasonable activities" in handling the Michigan automobile strike in 1937, interpreted as a climax of White House resentment against the committee.

The committee never has had White House endorsement and it has been evident that as it progressed with hearings it has aroused White House feelings. This is attributed to the character of testimony presented before the committee. The testimony has frequently included charges against administration branches of government or their representatives, blaming them either for Communistic leanings or encouragement of radical labor agitation. Moreover testimony has been placed before the Dies Committee in which investigators for the LaFollette Senate Civil Liberties Committee have been accused of being Communistic. The LaFollette committee, said to have been set up at the behest of the CIO, has administration support and, when short of funds, was given expert and clerical help from government departments. In contrast, the administration has denied requests of the Dies Committee for similar aid.





## NEWCOMER

Henry and Edsel Ford pictured with the new Mercury 8 at the Ford test track in Dearborn. The newcomer has a 116-in. wheelbase, measures more than 16 ft. from bumper to bumper. Its V-8 engine develops 95 hp. Ford's '39 passenger car line will also include the Utility model on a 112-in. wheelbase with the 85 hp. V-8 engine. All cars are equipped with hydraulic brakes. Description of Ford's new model offerings will appear in the Nov. 5 issue of **AUTOMOTIVE INDUSTRIES**.

# Ourselves and Government

## Ford vs. NLRB Argument Set for Dec. 5; CAA International Division to Handle Overseas and Foreign Air Commerce Matters

A weekly check list of legislative, executive and judicial actions affecting the automotive industries. First appeared in June 25 issue, p. 831. Corrected to Oct. 27.

### CONGRESS

Adjourned June 16, sine die. All members of House and 36 Senators retire or face election this fall.

#### Legislative Legacies

**MONOPOLY STUDY.** Probable dates for starting public hearings still tentatively fixed for Nov. 14 or 15. Next meeting date for the full committee has not been scheduled.

Department of Commerce members of the anti-monopoly committee report that returns to their trade association questionnaire sent out Sept. 26 show a desire on the part of association executives to cooperate with the inquiry and that out of 2300 national and interstate trade associations to which the inquiries were sent, only one association has expressed unwillingness to cooperate. They declined to disclose the name of the association. Complete returns from the questionnaires, which asked 34 major questions and an additional number of sub-questions, are expected by the Department by Nov. 15. Thus far only 100 active associations have sent in completed copies of the schedule.

### LABOR RELATIONS CASES

**FORD vs. NLRB.** Supreme Court argument on the appeal of the Ford Motor Co. for review of the Sixth Circuit Court opinion of last spring has been postponed from Nov. 7 and tentatively fixed for Dec. 5. The postponement was ordered because of the illness of Ford counsel. The Court on Oct. 10 granted the company's petition for review of the lower court's decision under which the NLRB was permitted to reopen its case covering alleged unfair labor practices at the Ford River Rouge plant. The Board had asked for a reopening of the case to correct procedural defects.

NLRB has petitioned the Supreme Court for review of a decision from the Circuit Court of Appeals in Chicago that sit-down strike participation by employees and injury of company property removed the necessity for rehiring the strikers. The case involved the Fansteel Metallurgical Corp., which was directed in a Labor Board order to reinstate 92 workers because the NLRB found the sit-down strike resulted from failure of the

company to bargain with employees belonging to the Amalgamated Association of Iron, Steel and Tin Workers of America. The lower court ruled that the company did not have to reinstate the strikers.

### CIVIL AERONAUTICS AUTHORITY

**CIVIL AERONAUTICS AUTHORITY.** Establishment of an International Division, headed by Samuel E. Gates, of Los Angeles, former chief of the Air Commerce Bureau's International Section, has been announced by the CAA. The division will have general supervision over all overseas and foreign air commerce matters coming under the jurisdiction of the Authority and will study public and private air laws, carrier rates in foreign air transportation, and foreign subsidies given airlines, and related matters.

CAA has purchased a four-place waco

AVN 8, with "tricycle" landing gear from the Waco Aircraft Corp., Troy, Ohio, to be used to test instrument landing systems, to help in the development of ultra-high frequency radio communication, and to study the operating characteristics of this type of landing gear.

Non-scheduled operators have been exempted from the requirements for securing Certificates of Public Convenience and Necessity and from certain other provisions of the law except where the Authority may prescribe regulations to the contrary.

The Authority has appointed a standing committee composed of Chairman Edward J. Noble, Member Robert H. Hinckley, and Administrator Clinton M. Hester, to maintain direct liaison with airline pilots in a step aimed at security greater safety in air transportation.

### FEDERAL TRADE COMMISSION

**VS. GENERAL MOTORS.** Hearings in Detroit, Oct. 24 on complaint alleging unfair competition and practices tending to create monopoly in the sale of automobile parts, accessories and supplies. John L. Hornor is trial examiner and Everett F. Haycraft is FTC's attorney.

**SIX PER CENT CASE.** FTC cited Ford and General Motors in July, 1937, complaining of false and misleading representations in advertising plans for financing automobile sales. FTC brief in the Ford case filed Oct. 15. The next step is for the company to file answer within a 15 or 20-day period although this period is customarily extended upon request.

**FOB PRICES** case vs. G.M. and Ford, in which FTC alleged price advertising was misleading because of failure to include standard equipment. Commission continues to defer setting a hearing date.

**FAIR TRADE PRACTICE** rules for retail automobile dealers, introduced at public hearings during last NADA meeting in December (see A.I., April 30, 1938), are still under study by the FTC fair trade practice division headed by George McCorkle.

**MANUFACTURER - DEALER** investigation under the Withrow Resolution. The investigators currently are going into more states and contacting more firms.

### DEPARTMENT OF LABOR

**WAGES AND HOURS.** Law became effective at midnight on Oct. 23 after Administrator Andrews and his aides rushed through scores of regulations and interpretations to guide industry. The law, esti-

(Turn to page 522, please)

## Passenger Car and Truck Production

Inching down to a seasonal low point, production of passenger cars and trucks in the United States and Canada dropped in September about 7.5 per cent from the August figure to total 89,623. Compared with the output in September a year ago, the decrease amounts to 49 per cent.

The appended data for nine months' production during 1938 as compared with 1937 reveal a slacking off this year of approximately 58.5 per cent.

	September 1938	August 1938	September 1937	Nine Months	
				1938	1937
<b>Passenger Cars—U. S. and Canada</b>					
Domestic Market—U. S. ....	60,177	53,955	110,122	1,038,192	2,887,398
Foreign Market—U. S. ....	4,982	4,669	8,549	128,949	190,116
Canada .....	4,290	3,063	1,926	88,728	117,076
<b>Total .....</b>	<b>69,449</b>	<b>61,687</b>	<b>120,597</b>	<b>1,255,869</b>	<b>3,194,590</b>
<b>Trucks—U. S. and Canada</b>					
Domestic Market—U. S. ....	8,697	23,250	36,402	248,530	565,895
Foreign Market—U. S. ....	9,678	8,610	16,140	103,658	149,400
Canada .....	1,799	3,389	2,491	34,978	44,585
<b>Total .....</b>	<b>20,174</b>	<b>35,249</b>	<b>55,033</b>	<b>387,166</b>	<b>759,890</b>
<b>Total—Domestic Market—U. S. ....</b>	<b>68,874</b>	<b>77,205</b>	<b>146,524</b>	<b>1,286,722</b>	<b>3,453,293</b>
<b>Total—Foreign Market—U. S. ....</b>	<b>14,660</b>	<b>13,279</b>	<b>24,689</b>	<b>232,607</b>	<b>339,516</b>
<b>Total—Canada .....</b>	<b>6,089</b>	<b>6,452</b>	<b>4,417</b>	<b>123,706</b>	<b>161,671</b>
<b>Total—Cars and Trucks—U. S. and Canada ..</b>	<b>89,623</b>	<b>96,935</b>	<b>175,630</b>	<b>1,643,035</b>	<b>3,954,480</b>



## News of the Industry

### SHOW WEEK EVENTS

• A long list of meetings, luncheons, and dinners is scheduled for National Automobile Show Week, which opens Friday (Armistice Day), Nov. 11, in New York. A preliminary list shows the following:

**Thursday, Nov. 10**  
12:15 P.M. Advertising Club Luncheon, General Hugh S. Johnson, Speaker.

4:00 P.M. Preview General Motors Show, Waldorf-Astoria Hotel.

**Friday, Nov. 11**  
11:00 A.M. Trustees Meeting, Automotive Safety Foundation, Commodore.

12:15 P.M. Luncheon, Commodore Hotel, Automotive Safety Foundation.

12:30 P.M. General Motors Luncheon to Technical Editors, Waldorf-Astoria.

2:00 P.M. National Automobile Show Opens, Grand Central Palace.

2:00 P.M. Chrysler Automobile Salon.

2:00 P.M. Motor Truck Show Opens, Port of Authority Building.

4:30 P.M. General Motors Press Reception, University Club.

**Saturday, Nov. 12**  
10:00 A.M. Automotive Safety Foundation Meeting, 366 Madison Avenue, New York.

12:00 Noon Luncheon and Meeting of Eastern Dealers, Federal Motor Truck Co., Commodore.

12:30 P.M. Reo Dealer Meeting and Luncheon, Hotel New Yorker.

**Monday, Nov. 14**  
10:00 A.M. Directors' Meeting, Automobile Manufacturers Association, New York Headquarters.

10:00 A.M. Society of Automotive Engineers, Technical Sessions, Hotel New Yorker.

12:00 Noon Graham-Paige Dealer Luncheon, Hotel Biltmore.

12:30 P.M. Willys-Overland Luncheon for Newspapermen, Hotel Biltmore.

1:00 P.M. Luncheon Meeting, Roosevelt Hotel, Motor Truck Committee of Automobile Manufacturers Association.

2:00 P.M. Society of Automotive Engineers, Nat'l Transportation Engineering Meeting, Hotel New Yorker.

6:00 P.M. Automobile Show Dinner, Society of Automotive Engineers, Commodore Hotel.

**Tuesday, Nov. 15**  
10:00 A.M. Society of Automotive Engineers, Technical Sessions, Hotel New Yorker.

10:30 A.M. Rubber Manufacturers Association, Annual Meeting, Lotus Club.

12:00 Noon Automotive Electric Association, Luncheon and Meeting, Hotel Astor.

12:30 P.M. Willys-Overland Dealer Luncheon, Hotel Biltmore.

2:00 P.M. Society of Automotive Engineers, Nat'l Transportation Engineering Meeting, Hotel New Yorker.

6:30 P.M. Motor Truck Show Dinner, Hotel Astor.

6:30 P.M. International Dinner, Ritz-Carlton Hotel.

### CONVENTIONS AND MEETINGS

American Finance Conference Convention, Chicago ..... Nov. 10-11

SAE Annual Dinner, New York, ..... Nov. 14

National Association of Finance Companies, Annual Convention, Chicago ..... Nov. 14-15

SAE National Transportation Engineering Meeting, New York, Nov. 14-16

National Safety Council Meeting, Chicago ..... Nov. 14-18

American Petroleum Institute Meeting, Chicago ..... Nov. 14-18

National Industrial Traffic League Meeting, New York ..... Nov. 17-18

National Standard Parts Association Meeting, Chicago ..... Dec. 2-3

Congress of American Industry, New York ..... Dec. 7-9

SAE Annual Meeting, Detroit, ..... Jan. 9-13

### SHOWS AT HOME AND ABROAD

Hartford, Conn., Automobile Show, Nov. 3-10

Washington, D. C., Automobile Show, Nov. 5-12

Atlantic City, N. J., Automobile Show, Nov. 8-12

New York, National Motor Truck Show, ..... Nov. 11-17

New York, National Automobile Show, Nov. 11-18

Philadelphia, Pa., Automobile Show, Nov. 11-18

Pittsburgh, Pa., Automobile Show, Nov. 11-18

Detroit, Mich., Automobile Show, Nov. 11-19

San Francisco, Calif., Automobile Show, ..... Nov. 11-19

Columbus, Ohio, Automobile Show, Nov. 12-19

Buffalo, N. Y., Automobile Show, Nov. 12-19

Chicago, Ill., Automobile Show, Nov. 12-19

Milwaukee, Wis., Automobile Show, Nov. 12-19

Minneapolis, Minn., Automobile Show, Nov. 12-19

Boston, Mass., Automobile Show, Nov. 12-19

Los Angeles, Calif., Automobile Show, Nov. 12-20

St. Louis, Mo., Automobile Show, Nov. 13-19

Syracuse, New York, Automobile Show, ..... Nov. 14-19

Elmira, N. Y., Automobile Show, Nov. 14-19

Des Moines, Iowa, Automobile Show, Nov. 14-19

New Haven, Conn., Automobile Show, Nov. 14-19

Scranton, Pa., Automobile Show, Nov. 15-19

Omaha, Neb., Automobile Show, Nov. 15-20

Allentown, Pa., Automobile Show, Nov. 17-20

Indianapolis, Ind., Automobile Show, Nov. 19-25

Baltimore, Md., Automobile Show, Nov. 19-26

Rochester, N. Y., Automobile Show, Nov. 19-26

Montreal, Canada, Automobile Show, Nov. 19-26

Long Island Automobile Show, World's Fair, N. Y., ..... Nov. 23-Dec. 4

Newark, N. J., Automobile Show, Nov. 26-Dec. 3

Kansas City Automobile Show, Nov. 26-Dec. 3

National Motor Show of Canada, Toronto, Ont., ..... Nov. 26-Dec. 3

New Orleans, La., Automobile Show, Dec. 3-5

Denver, Colo., Automobile Show, Dec. 5-10

Automotive Service Industries Show, Chicago ..... Dec. 5-10

Grand Rapids, Mich., Automobile Show, ..... Jan. 2-7

National Motor Boat Show, New York, Jan. 6-14

Seattle, Wash., Automobile Show, Jan. 9-15

Berlin, Germany, Automobile Show, Feb. 17-March 5

## Express Highways

(Continued from page 513)

Fair and the San Francisco Exposition next year.

"The American Road Builders' Assn. has created a standing committee on elevated highways, serving on which are municipal engineers in several of our leading cities," he stated. "This committee is endeavoring to collate the developing data relating to the construction of elevated highways. This data is not inconsiderable. We expect it will increase in importance during the next few years."

Mr. Iden declared the question is not one that interests only the road builder and the engineer. Pointing out that the internal engine is forcing reconsideration of plans for municipal areas, he said that all architects should be stimulated to make a new effort and inspired to a new design.

## Metal Markets

(Continued from page 517)

the next six months. Certain it is that heavy tonnages were booked by sheet and strip mills and relatively little fresh business at higher prices is expected to come out during the first half of November. Also certain it is that, so long as some consumers are able to get low-priced steel, others will bring considerable pressure to bear to be accorded the same advantage, regardless of whether or not they went through the formality of signing on the dotted line before the lower prices were rescinded. All of which indicates that, just because the spectacular price war of a few weeks ago came to a sudden halt, the market can hardly be characterized as having by some sort of a miracle attained overnight strength. The rate at which specifications will come out in the next two months, which is the true determinant of demand, will be the all important factor in shaping the relations between producers and consumers.

Tin prices moved into higher ground. For spot and nearby Straits tin the asking price at the beginning of the week was 46 to 46 $\frac{1}{8}$  cents. A month ago the price stood at 43 $\frac{3}{4}$  cents. The cost of importers is offset in part by the downward slide of the Pound Sterling in that time from \$4.83 $\frac{1}{4}$  to \$4.76 $\frac{1}{2}$ . To the automotive consumer, however, the price change in the last month means an increase of \$50 per gross ton.—W. C. H.

## TOOLS OF TOMORROW

### Streamlined Presses

*... Modern styling enhances appearance, reduces weight, and saves floor space*

Streamlining, not only to enhance appearance, but also to reduce weight and save floor space has been adopted in the design and construction of a new line of presses built by the Hydraulic Press Mfg. Co., Mount Gilead, Ohio. The new series of presses, trade-named "Smooth Line," is compactly self-contained with the operating unit, including the H P-M model 4R radial pump driven by an electric motor mounted overhead and totally enclosed so as to harmonize with the entire press styling. All piping and control mechanism are concealed. Every operating element, however, is conveniently accessible for adjustment and maintenance.

These new presses incorporate the H-P-M "Fastraverse" system of operation, which is said to assure production speed with hydraulic smoothness and versatility. The principle results in rapid ram travel to the work, a slower pressing speed to

permit the metal to flow to the contours of the die, and a speedy return of the ram to its initial position.

The Hydraulic Press Mfg. Co. retained the cooperation of Harold Van Doren & Associates, industrial designers, in creating the styling for the "Smooth Line."

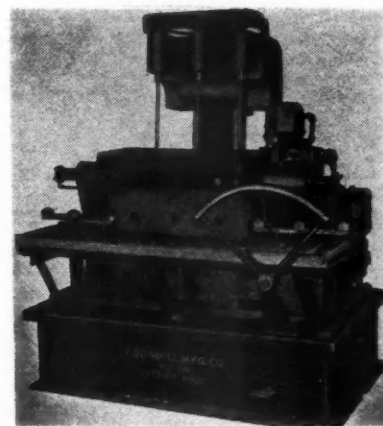
### Valve Lifter Bores

*... Cogsdill machine finishes three bores in engine block at each cycle of the headstock*

Now in operation in one of the large automotive plants is a multiple-spindle machine for "Bearing-izing" three valve lifter bores in an internal combustion engine block at each cycle of the headstock. The machine was designed and built recently by the Cogsdill Twist Drill Co., developers of the "Bearing-izing" process for hole finishing.

As the cylinder blocks come off of the line conveyor they go to a conveyor section built into the machine from which they are picked up by air-operated plungers entering the camshaft bores. Movement of a control lever opens the Vickers hydraulic system to start the ram down at a rapid advance until a cam engages the feed control valve to produce the desired feed of the tools through the bore.

The spindles, operated at a speed of 2500 r.p.m., drive the "Bearing-izing" tools so as to produce, by the cam-actuated peening rolls, approximately 200,000 blows per minute on the surface of the bore. These



Cogsdill multiple-spindle machine for "Bearing-izing" valve lifter bores.

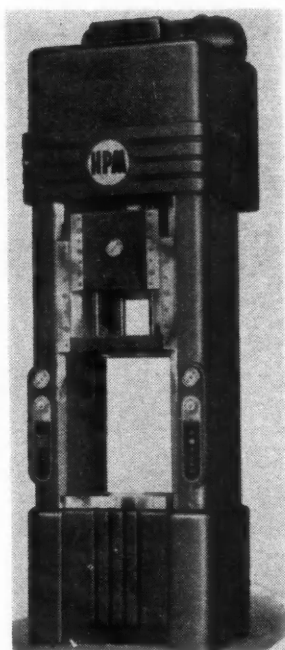
sharp blows drive down the peaks left by the peening operation; condense and work-harden the metal, leaving a burnished finish which is said to be ideal for lubrication and highly resistant to wear and corrosion.

A similar machine with suitable spindle speed and feed cycle is used to finish ream the bores, leaving about 0.001 in. on the diameter for the "Bearing-izing" operation. These machines have an approximate capacity of 60 six-cylinder blocks per hour.

### Bolt Machine

*... Oster Mfg. Co.'s latest made in two sizes: 1 1/4 in. and 1 1/2 in.*

The Oster Mfg. Co., Cleveland, has added a new bolt machine, known as the "Rapiduction Junior," to its line of threading equipment. The machine is made in two sizes: the No. 541 with a capacity up to 1 1/4 in., and the No. 542 which accommodates sizes up to 1 1/2 in. When stripped of die-head and vise carriage, the machine can be adapted to chamfering, drilling, reaming, boring, tapping, and other operations.



The Hydraulic Press Mfg. Co.'s new "Smooth Line" machine.

### Monthly Motor Vehicle Production—U. S. and Canada

	Passenger Cars		Trucks		Total Motor Vehicles	
	1938	1937	1938	1937	1938	1937
January	168,890	324,191	56,240	74,995	227,130	399,186
February	151,133	310,961	51,456	72,939	202,589	383,900
March	186,341	423,006	52,257	96,016	238,598	519,022
April	190,111	452,907	48,022	100,324	238,133	553,231
May	168,599	443,412	41,584	96,965	210,183	540,377
June	147,545	429,333	41,854	91,820	189,399	521,153
July	112,114	372,913	38,330	83,996	150,444	456,909
August	61,687	317,270	35,249	87,802	96,936	405,072
September	69,449	120,597	20,174	55,033	89,623	175,630
October		306,040		31,939		337,979
November		309,121		67,508		376,629
December		258,769		88,117		346,886
Total		4,068,520		947,454		5,015,974



## BUSINESS IN BRIEF

Written by the Guaranty Trust Co., New York

Statistical evidences of an accelerating improvement in business appeared last week. The *Journal of Commerce* index of activity for the week ended Oct. 15 was at 89.2, comparing with a revised figure of 86.4 for the preceding week and with 100.0 a year earlier.

Continuing mild weather in most parts of the country last week had a restraining effect on retail sales of seasonal goods, and in lesser degree on wholesale trade also, according to reports by Dun & Bradstreet, Inc., the indicated declines in retail trade from the preceding week's figures ranging from 2 to 4 per cent.

Freight car loadings in the week ended Oct. 15 increased by 23,648

to a total of 726,612 cars, as against 806,095 cars a year earlier. The recent increase has been chiefly in loadings of miscellaneous freight, indicative of the current expansion of manufacturing activity.

Professor Fisher's index of wholesale commodity prices for the week ended Oct. 22 stood at 79.9, as compared with 80.3 in the preceding week.

Member bank reserve balances during the week ended Oct. 19 increased by \$292,971,000. Excess reserves climbed to an estimated total of \$3,270,000,000, or \$220,000,000 more than at the beginning of the week.

Total bills discounted declined from \$9,299,000 to \$6,072,000, while industrial advances of \$15,446,000 at the end of the week were only slightly reduced.

## Ourselves & Government

(Continued from page 519)

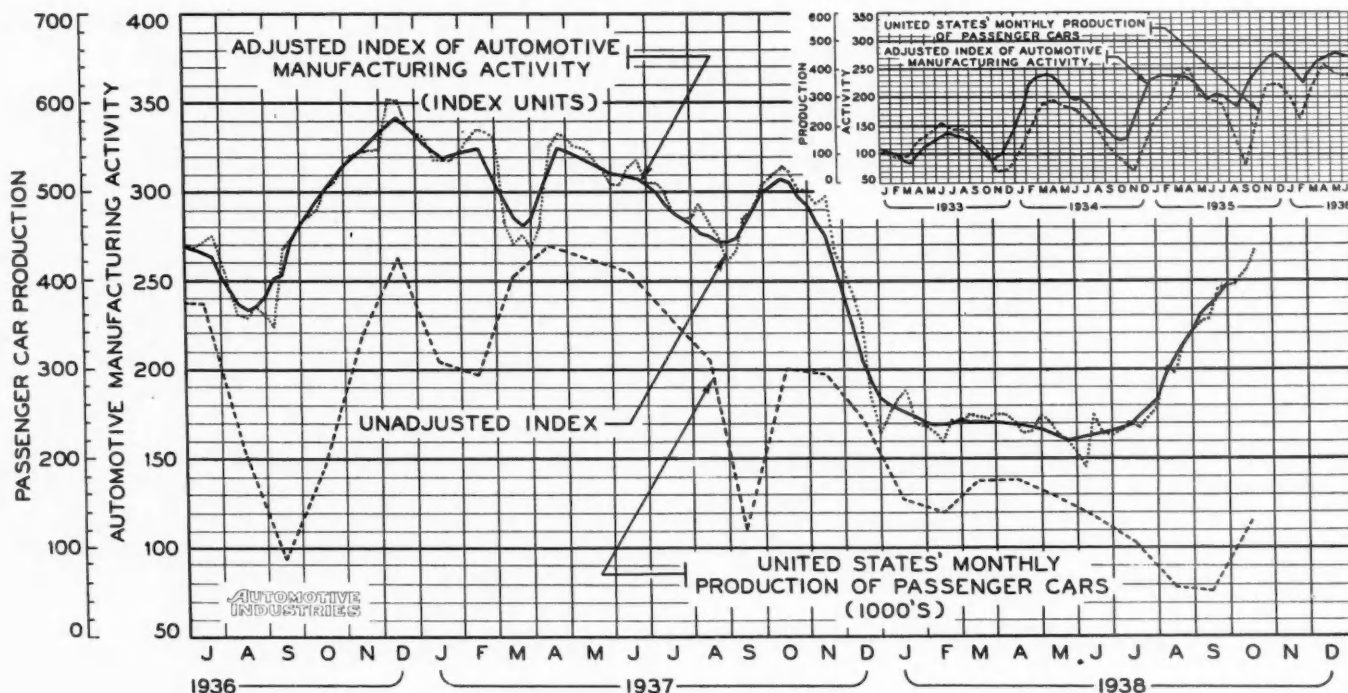
mated to bring pay raises to some 750,000 employes in interstate commerce industries and shorter hours or overtime pay to 1,500,000 more workers, prescribes for the first year of operation a minimum wage of 25 cents an hour but this can be raised to as high as 40 cents, if so recommended by an industry committee. Wage Hour Division is largely dependent upon voluntary compliance before January, at which time more money is expected to be appropriated by Congress to round out the agency's enforcement machinery and permit it to name industry committees.

### DEPARTMENT OF JUSTICE

Reports that charges of monopolistic practices against Chrysler and Ford in the automobile financing case will be dropped pending the approval of the Federal Judge in South Bend were denied on Monday by Department of Justice officials. They said that negotiations are still under way, that they are in substantial agreement on the terms of a consent decree with Chrysler and Ford but that nothing further has been done to put the proposals in writing. It was added also that the Department has taken no further steps against any of the three companies involved.

"Our conversations are still in progress," said Holmes Baldrige, assistant to the attorney general in charge of the cases against the motor companies. "We have reached substantial agreement with the Ford Motor Co., and with the Chrysler Corp. Not all details are completed, however and we will have to argue quite a bit more."

### Pressure for Dealer Stocks Pushes Activity to Higher Level



Automotive manufacturing activity for the week ending Oct. 22, influenced by unexpected and continuing demand for dealer stocks, pushed the unadjusted index figure to 267, representing a gain of 12 points over the preceding week, which was 6 points ahead of the week ending Oct. 8. While it is still to be expected that the rate will trend down-

ward after the automobile shows, the comparative paucity of dealer stocks of new cars up to the first of October, the fact that this year's National Automobile Show is later than last year's, and the fact that Ford has not yet completed its dealer sampling program, all tend to guarantee several weeks of continued activity at a high rate.



# Just Among Ourselves

## Men and Shows

### Far and Near

NOVEMBER 11 in New York will see more automotive men on hand than many another show opening. National Automobile Show and the National Truck Show running concurrently means a week crowded with meetings, banquets, and aching feet. It will also be a very good week for the taxicab business.

Citizens of Hartford, Conn., and Washington, D. C., will be able to say to sophisticated New Yorkers "what, you're just getting around to your automobile show," because theirs are being held earlier. Citizens of Brooklyn and Long Island will get advance practice on how to get to the World's Fair 1939, because their automobile show is being held in the Transportation Building at the World's Fair grounds ten days after the show in New York. But in most large cities—not so many of them as last year—little counterparts of the New York show will produce a merry clicking of turnstiles—not so many as last year either.

### The Last, Maybe First

THERE is some irony in the fact that most of the discussion about arranging new model announcements so that they come within striking distance of the automobile shows has been among members of the Automobile Manufacturers Association. But the announcement which comes nearer allowing the show-goer to see something he hasn't seen before, is that of Ford, who is not a member of the Automobile Manufacturers Association. There are many things on the economic horizon for 1939 which lead me to believe that this may be another case where the old Biblical injunction will come about; yea, verily, in 1939, the last may become first.

### Next Week From Paris

THE Paris International Automobile Salon opened a week late on account of the late war scare in Europe. Our description of it arrived Oct. 27, too late for inclusion in this week's issue. The story, by W. F. Bradley, will appear in next week's issue.

To me the most significant thing gleaned

from preliminary reading of the story was Mr. Bradley's remark that there was an overwhelming trend toward conservatism in body designing. Like the snows of yesteryear made famous by Francois Villon, ultra-streamlining has melted into more conventional fairing. It is a well known fact that in the United States, economic depression brings public demand for darker colors on cars. Perhaps it's impossible to get excited about Czechoslovakia and streamlining at the same time.

## We Are Not Immune

MR. BERT GARMISE, who is director of circulation for the rejuvenated *Scribner's Magazine*, very kindly sent me an advance copy of the November issue, which contains a quiz of 50 questions about various phases of the owning and operating of automobiles. The "Scribner Quiz" is a monthly feature of the magazine. Conducted by Irving D. Tressler, it is probably the most literate form of the quiz-mania which is sweeping the country. Just a minute please, while I take the quiz myself . . . my score was 90 per cent, counting three questions in my favor where Mr. Tressler slipped a little himself. Maybe you'd like to try it.

## Uncle Sam Tells Where the Dollar Goes

I WONDER how many people realize that the National Bureau of Standards issues a letter circular (LC 520) on the cost of operating an automobile. Until last week it was one of those "things I never knew 'til now."

Necessarily, the circular is rather an outline of the factors entering into operating cost, because of the number of variables which introduce themselves into any discussion of the subject.

Like nearly everyone else who is supposed to have any special knowledge of the automobile industry, the Bureau of Standards has been asked the question "what automobile gives the most value for the money." And I suppose that many of us have answered the question in about the same words as the Bureau of Standards uses. As a matter of interest, here's what they say.

"Some cars are more economical, some more powerful, some excel in riding comfort or appointments, others in their ability to withstand rough usage. It is better in general to choose a car within any price class which has the particular characteristics that one desires for his own use."

The only trouble with that answer is that most people don't believe it. They expect that by some secret magic, there must be a car which is everybody's dream of perfection; that will be perfect for John Doe in Maine, and Richard Roe in California.

—HERBERT HOSKING.

# Four Nash Series

**T**HERE will be four series and a total of 22 different models in the Nash line for 1939. Factory-delivered prices range from \$770 to \$1,235 and are said to represent reductions of up to \$68 as compared with last year's prices. The four series and the 22 models are as follows:

Nash LaFayette Special (117-in. wheelbase): Business coupe, two-door sedan, four-door sedan, and four-door sedan with trunk.

Nash-LaFayette DeLuxe (117-in. wheelbase): Cabriolet, all-purpose coupe, victoria sedan, business coupe, four-door sedan, and four-door sedan with trunk.

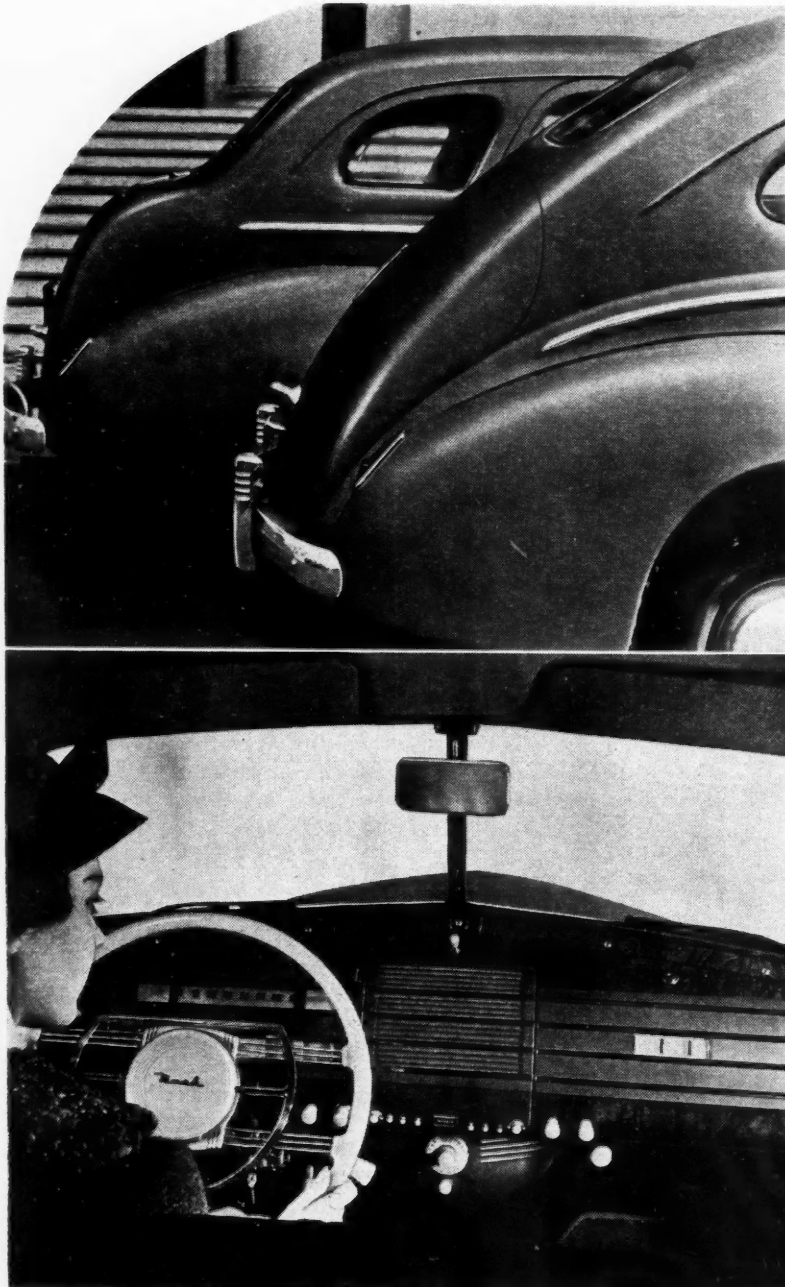
Nash Ambassador Six (121-in. wheelbase): Cabriolet, all-purpose coupe, victoria sedan, business coupe, four-door sedan, and four-door sedan with trunk.

Ambassador Eight (125-in. wheelbase): Cabriolet, all-purpose coupe, victoria sedan, business coupe, four-door sedan, and four-door sedan with trunk.

All cars have been completely restyled and embody a streamline motif. An improved version of last year's "conditioned-air" system is offered as standard equipment on the Ambassador Eight and as optional equipment on the other series. It is for use only in winter driving, car ventilation being effected by means of front-door windows in summer. The new "conditioned-air" system, which includes automatic temperature control, is to be known as the "Weather Eye."

The rating of the L-head engine of the Nash-LaFayette or low-priced series has been raised to 99 hp., the compression ratio having been increased to 6.3. This engine has the manifold cast in the engine block. A two-jet carburetor is now fitted and the fuel consumption is claimed to have been lowered by as much as 10 per cent. The Ambassador Six and Eight carry the same valve-in-head engines with dual ignition as last year, with unchanged ratings of 105 and 115 hp.

New, longer shock absorbers at the rear are mounted inside the body. Front shock absorbers are the same as last year. Column-mounted gear-shift levers are optional on all models. Improvements have been made in the sound-proofing of the bodies, for which purpose use is made of a material called "Sand Mortex," consisting of grains



Nash models for 1939 may be had with either the streamlined or conventional trunk back

The instrument panel of the new models is of plastic material with chrome strips. The speedometer is a ribbon type with figures in a horizontal row

# Offered for 1939 Season

of sand suspended in a semi-rigid material. The Nash bed arrangement is again being offered and has been improved to make it more comfortable and so it can be set in the rear of the car. All models have hydraulic brakes. Bodies have been widened and it is claimed that both front and rear seats will now accommodate three persons with comfort. By increasing the width and height of the windshield and changing its pitch, driver's vision has been improved.

The hood, which is of the alligator type and counterbalanced, is provided with an automatic catch at the top of the radiator grille which prevents it from being forced open by the wind in the event it has not been properly locked. The lock for the hood is located near the base of the grille.

The new cars have a narrow, die-cast radiator grille, wide catwalks broken by vertical grille bars, and massive, rounded fenders. Headlights are inset into the front of the fenders and are mounted on two-way swivels for adjustment. Bumper-rail guards are available as extras. Windshield-wiper blades are longer than last year.

Ventilator-type windows are installed in front doors for use during the summer. Instead of locking rear doors by reversing the door

handles, they are now locked by means of buttons on the window molding. The front-door upper hinge is concealed. The streamlined back of the body has just a trace of a fin at the center. This type of back or the conventional trunk back may be had on any of the four-door sedans without extra charge. There is practically no difference between the two body styles as regards luggage capacity. On the streamlined backs the rear-compartment door is counterbalanced, the same as the engine hood, and is provided with an automatic support for use when the trunk is opened fully. It catches and re-

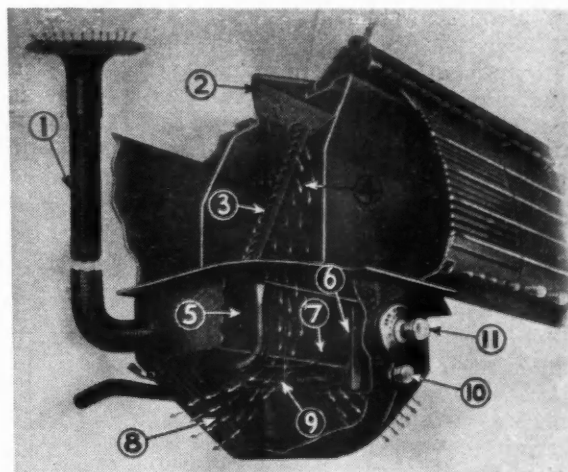
leases automatically when the door is suitably manipulated. The combined rear and stop lights are built into the rear fenders. There is a license-plate light in the center of the trunk door.

Seat cushions are more comfortable, having more coil springs and more padding. Soft-rubber cushions are standard on Ambassador Eight models and optional on others. Interior sun visors now have a screw adjustment on the bracket, so they will not sag out of place.

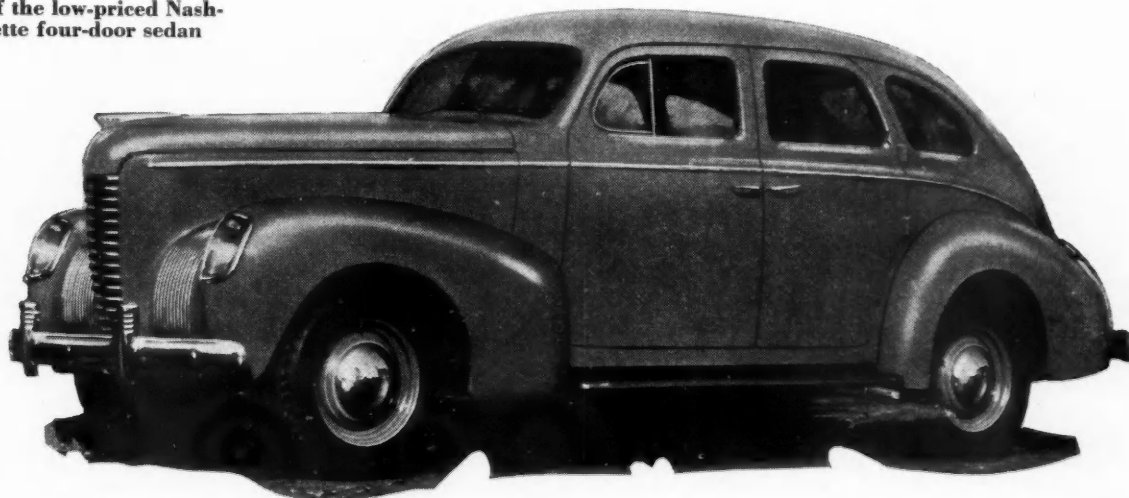
The new safety instrument panel is of such design that it is easier to  
(Turn to page 535, please)

This cutaway view of the "Weather Eye" has been taken through the instrument panel

1. Windshield defroster
2. Cowl ventilator
3. Shield for rain and sleet
4. Filter for air
5. Heating core
6. Thermostat
7. Balancing tube
8. Air circulating into the car
9. Fan to pull fresh air into car when standing
10. Fan switch
11. Control dial



A view of the low-priced Nash-LaFayette four-door sedan





# Methanol-Base Anti-freeze Solutions

By P. M. HELDT

UP to a few years ago the principal products used to depress the freezing point of the water used in the cooling systems of automobiles in winter time included denatured alcohol, glycerine, and ethylene glycol. To this was later added methanol, the synthetic equivalent of wood alcohol, which offers a number of advantages. An anti-freeze, to meet the requirements of automobile service, must possess the following characteristics:

1. It must be soluble in water.
2. It should have a low molecular weight.
3. It should preferably have a high specific heat.
4. It must not attack any of the metals or nonmetallic materials of the cooling system.

There is no need to argue the first requirement, because any substance that does not dissolve in water cannot well affect the freezing point of water, hence it cannot give protection against freeze-ups as long as water is used as the cooling medium. Water, by the way, is a most advantageous cooling liquid, not only on account of its low cost and wide distribution, but also because of its high specific heat. Certain other fluids of inherent anti-freeze qualities, such as kerosene, have been used as winter cooling fluids to a certain extent, but have generally been found unsatisfactory because of their low specific heat. The specific heat of kerosene, for instance, is only about one-half that of water, which means that with kerosene the temperature gradient in the system will be at least twice as great, the cylinder walls will be hotter, and the tendency to detonate greater.

The reason the non-freeze should have a low molecular weight is that the depression of the freezing point of water is directly proportional to the number of molecules of the anti-freeze or solute per unit mass of water. If the molecular weight of the anti-freeze is low, there will be more molecules to the pound or to the quart, and a smaller proportion of the anti-freeze is required to depress the freezing point of water a given

number of degrees below 32 Fahr.

From this point of view, methanol has the advantage, as it has the lowest molecular weight of all members of the alcohol group. Its molecular weight is 32, as compared with 46 for ethanol or ethyl alcohol, and 74 for butyl alcohol. The molecular weight of glycerine is 92 and that of ethylene glycol, 62. Curves of freezing points of various anti-freeze solutions are shown in Fig. 1. From this it will be seen that a 27 per cent solution of methanol has a freezing point of zero Fahr., and that any of the other solutions must be of materially greater concentration to have the same low freezing point. In fact, glycerine (the substance with the highest molecular weight) depresses the freezing point only slightly, and it is used as an anti-freeze frequently in combination with denatured alcohol. From the foregoing it will be seen that a smaller volume of methanol per unit of cooling-system capacity is required to give protection from freeze-ups than of any other of the

anti-freezes in common use today.

The importance of the specific heat has been discussed already in connection with the use of kerosene. In pump circulation systems the rate of circulation is practically independent of the type of solution used, unless it should be unduly viscous, and for a given rate of circulation the cylinder walls will be the cooler the greater the specific heat of the cooling solution.

There is comparatively little difference between the specific heats of the various anti-freezes used in automobile practice, but that of methanol is the highest. Of course, what counts is the specific heat of the cooling solution and not that of the solute, and the specific heat of a solution does not vary directly with the concentration of the solution. It is claimed that a 10 per cent solution of methanol-base anti-freeze has a specific heat about 3 per cent higher than that of water, and a 15 per cent solution, a specific heat about 5 per cent higher. Up to a concentration of 25 per cent,

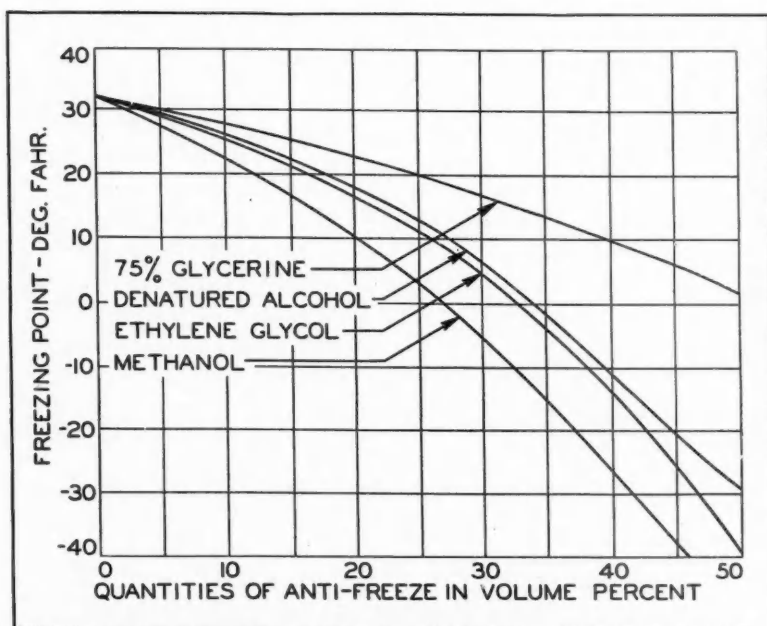


Fig. 1—Freezing points of anti-freeze solutions

# Amplify Cooling Effectiveness

the specific heat of the solution is higher than that of water. Such a solution, therefore, keeps the cylinder walls cooler even than pure water. Evidence of more energetic cooling was obtained by running an engine on a dynamometer under full load, with the spark slightly advanced, first with water in the cooling system and then with methanol-water. A distinct decrease in knock followed the change, and this seems to point to more effective cooling. For this reason a weak methanol-base solution is recommended for use in summer time, especially for cars whose cooling system is slightly inadequate. This solution is said to have two beneficial effects, that of increasing the cooling capacity of the system and that of preventing corrosion. The anti-corrosive effect, however, is not due to the methanol, but to a corrosion inhibitor which is added to the commercial product as sold for anti-freeze purposes.

Anti-freezes must be free from corrosive effect and must not attack any of the materials used in the construction of the cooling system. Corrosion usually is most severe in the cylinder block, and the rust there formed, together with any lime that may be precipitated from the water when it is heated to near the boiling point, may get into the radiator and clog up the fine passages of its core. The general effect then is the same as if the core is frozen up; that is, the water cannot circulate, the cooling effect is greatly reduced, and the car will "steam." Plain water, because of the fact that it holds air in absorption, promotes rusting of cast iron, and the need for a corrosion inhibitor is therefore really independent of the need for an anti-freeze.

At the present time cooling systems generally are so designed that when the car is being driven steadily under full throttle on a level road, there will be no boiling of the cooling water until the atmospheric temperature reaches 112 deg. Fahr. This takes care of cooling requirements, but leaves out of consideration the loss of cooling liquid due to expansion when the engine is suddenly

shut down after a prolonged hard run. The heat of the pistons and cylinder block is then thrown into the cooling water, and as circulation has practically ceased, boiling will occur at the cylinder walls, the cooling

methanol solution having a freezing point of zero Fahr. has a boiling point of 184 deg. Fahr. and in this respect the methanol solution is equal to a solution of ethyl alcohol having the same anti-freeze charac-

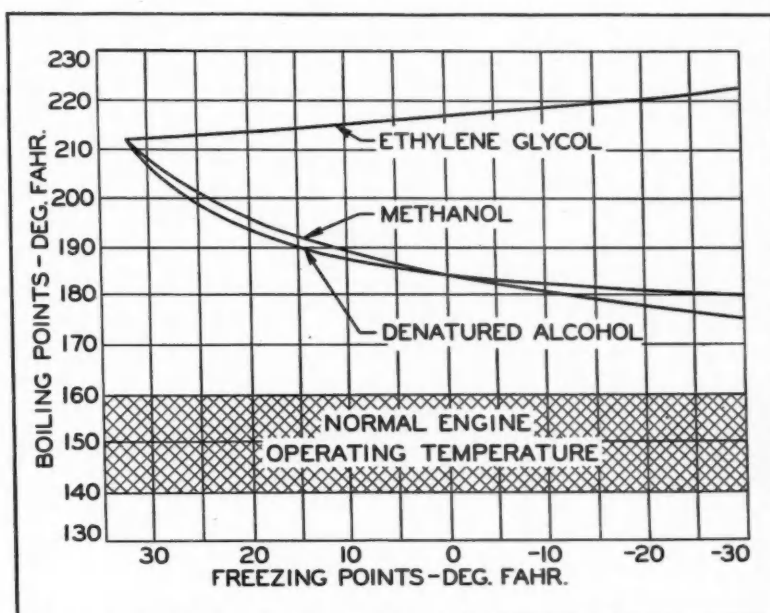


Fig. 2—Boiling points of anti-freeze solutions

liquid will "expand," and a certain amount of it will be forced from the overflow pipe of the radiator. This phenomenon is generally referred to as "after boil." It is usually more severe in large than in small engines, and the residual heat in the engine when a sudden stop is made may raise the temperature of the cooling liquid by from 20 to 40 deg. Fahr.

This loss of cooling solution through the overflow pipe is, of course, of particular importance where the more expensive anti-freezes are used. It depends on the one hand on the surplus capacity of the cooling system and, on the other, on the boiling point of the solution. It can be seen from Fig. 2 that a

liquid will "expand," and a certain amount of it will be forced from the overflow pipe of the radiator. This phenomenon is generally referred to as "after boil." It is usually more severe in large than in small engines, and the residual heat in the engine when a sudden stop is made may raise the temperature of the cooling liquid by from 20 to 40 deg. Fahr.

teristic. Certain other solutes, such as glycerine and glycol, actually raise the boiling point of water. Methanol-base anti-freeze is being manufactured and marketed under the trade name "Zerone" by the Ammonia Division of E. I. du Pont de Nemours & Co. of Wilmington, Del., and this company has made extensive tests with methanol-base and other automobile anti-freeze substances. One of the objections raised to anti-freezes which lower the boiling point has been that the protection given by these cooling liquids decreases as anti-freeze is lost by evaporation, and the tests bore particularly on this point. Stock solu-

(Turn to page 535, please)

# Standardization in Aircraft Engine

**C**OORDINATION of aircraft-engine design and production is necessary in this country particularly to maintain export sales, said A. H. Leak of the Wright Aeronautical Corp. in a paper presented at the S.A.E. national aircraft production meeting. A minimum life expectancy must be set down as one of the requirements, and the objective then should be to so design and manufacture the part that it will operate for at least this period with the least possible trouble and cost to the operator.

To produce and maintain satisfactory production designs it is necessary to pay close attention to each of the following items:

(a) Carefully developed design and test programs.

(b) Standardized engineering and drafting practices.

(c) Close cooperation between production and engineering departments, starting with the original design and manufacture of experimental parts.

(d) Utilization of developed units and parts in new models when practicable.

(e) Consideration of all suggested changes intended to simplify production and reduce costs.

(f) Adequate quality and finish control.

Under the heading of standardized practices the author discussed such items as ball- and roller-bearing fillets, involute splines, and screw threads. In aircraft the areas of abutment faces for anti-friction bearings often are limited, and closer tolerances on fillets than used in ordinary engineering practice are necessary. If aircraft fillets were standardized the number of bearing types produced could be reduced. As regards splines, the general trend seems to be toward the 30-deg. involute, and standardization of such splines by the industry would be desirable. The U. S. type of screw

thread with sharp corners is not well adapted for highly stressed parts, and for ground and rolled threads a fillet is necessary. The author suggested that existing standards be modified by providing for a fillet without destroying interchangeability.

The author also gave a number of illustrations of how aircraft engine parts are developed experimentally chiefly to cope with the constant increase in stresses due to increased outputs.

One such illustration related to the crankcase of a radial engine. It is assumed that a forged duralumin crankcase has long been satisfactory but that increases in section are made necessary by greater output and greater speed. Fig. 1A shows the usual duralumin construction, with studs located rather close to the diaphragm, so that the metal between studs and bearing is in tension. Basic engine dimensions being fixed, it is impossible in this particular case to add more duralumin, so a stronger material is necessary, and steel is selected.

On account of time limitations it is decided to "play safe" and maintain the tried stud and diaphragm relationship, and the design works out as shown in Fig. 1B. This leaves heavy steel sections at X, so it is necessary to mill out between stud bosses to keep the weight down. Here the production department has to accept the burden of rather costly milling operations, and the next step should be to eliminate these. The costly milling operations result from the location of the diaphragm, and if the latter could be moved out, the crankcase could be turned all over. Therefore, a laboratory program is carried through to find out whether the orthodox diaphragm location is really necessary or beneficial. By loading the cylinders hydraulically it is eventually found that the studs directly over the diaphragm are not the only ones that contribute load, and that the studs all around the cylinder are under load, primarily because adjacent cylinders act as stiffening beams. Tests on a smooth-turned crankcase also indicated that by moving the

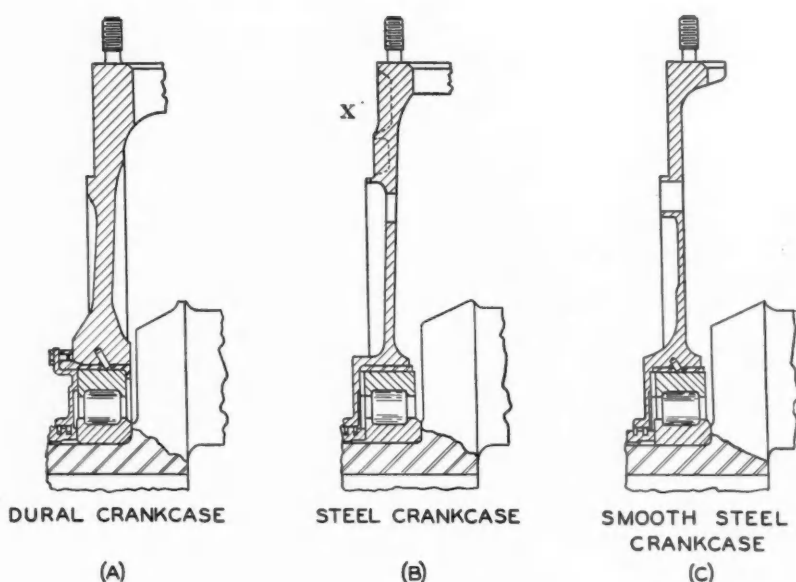


Fig. 1—The usual duralumin construction of crankcase for a radial engine with two improved designs



# Manufacture

*realized by concerted efforts of  
designers and production men*

diaphragm out, not only is production facilitated, but the load is more nearly uniformly divided between the studs. After endurance tests are completed the smooth design (Fig. 1C) supersedes the more expensive one.

Fig. 2A shows a conventional master connecting rod. As engine outputs are increased there comes a time when sections and strengths have become inadequate, which will show up in rod failures or bearing troubles due to deflection. The hub sections are limited by the knuckle-pin locations, and a general redesign is necessary. A laboratory program designed to throw light on how to reduce deflections through a more rational weight distribution shows that a uniform band of strength is desirable at each end of the rod, and also that tight-fitting knuckle pins contribute materially to rod stiffness. It is quite difficult to secure a uniform band of strength with the conventional design, and manufacturing considerations indicate that turning the I-beam at right angles will reduce costs. Fig. 2B illustrates the result of this investigation. The band at each end of the rod is fairly uniform, the knuckle pins are moved slightly farther out to provide a hub of fairly uniform thickness, rapid changes in section and resulting local stresses are avoided, and the rod is easier to machine and easier to polish, owing to the smoothness of its sections and its adaptability to the use of buffing or grinding wheels.

A reduction in the total number of parts to be made facilitates manufacture and servicing. It is true that engineers usually have pronounced personal ideas regarding the design of parts, but the mere fact that a part was designed by some one else should not be allowed to rule it out. If similar parts can be used in different models it facili-

tates production and service problems.

In automotive practice the use of developed parts or units in new models is quite common, and the aircraft industry already follows this same practice to some extent. For example, if an aircraft-engine power section is changed, the rear end of another model may be utilized—after due consideration of its merits and suitability. The major problem in that case is to keep the units interchangeable. As troubles crop up on different models, it is always easier for the engineering department to fix the trouble on the particular model affected, than to find a remedy that can be applied to all models and retain rear-end interchangeability.

Quality and finish control is one of the most difficult phases of production. So far a sample system has seemed to be the only practical

method of control, as the various degrees of finish can be noted on the drawings only in general terms. These samples must be tagged and be approved by the interested departments through the Design-Change Committee. Recently Profilograph instruments have become available, and after sufficient data have accumulated, it may be possible to place suitable notations on drawings to control finishes. For the present it appears that a sample system must be maintained and extended to specify Profilometer readings. Quality requirements change rather rapidly, and the expense of making frequent changes on drawings must be considered before applying readings to drawings.

There are other phases of quality control that are important. In the case of gears, for instance, as long as all gears used in a certain plant

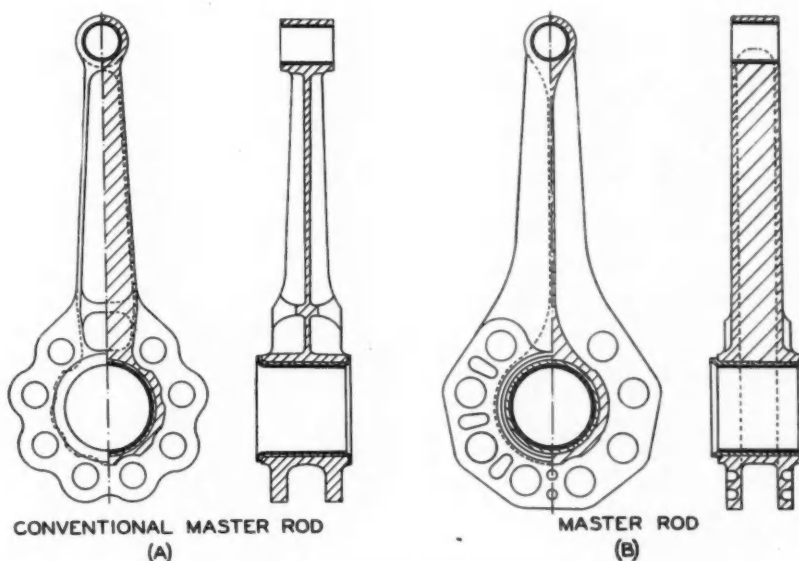


Fig. 2—Conventional master rod and the design evolved through investigation

are machine-cut the quality may be uniform and no question as to the degree of finish arise. If, however, an important heavily loaded gear requires special treatment and grinding equipment is provided to produce a better finish, which may be supplemented by a light buffing operation, this immediately lifts the particular gear to a higher finish level, and the general tendency then is to immediately expect all gears manufactured by the company to be raised to the same finish level. Such treatment, of course, is unwarranted for gears that have long operated satis-

factorily with the ordinary machine-cut finish. In the author's opinion, two or three samples should be provided to control the quality of gear finishes, as follows:

1. Machine-cut, hardened and lightly lapped.
2. Hardened, ground, and lightly lapped.
3. Hardened, ground, lapped and lightly buffed.

These samples, with Profilometer readings attached, will provide a range of finishes from which a selection can be made in accordance with the loading and operating conditions.

## Alclad in Aircraft

**T**EN Years' Service Experience with Alclad Materials in Aircraft" was the title of a paper read at the S.A.E. national aircraft production meeting by Frederick C. Pyne of the Aluminum Company of America. The term Alclad (trade-marked by the Aluminum Company of America) covers a group of aluminum-alloy products. These materials are commercially available in sheet form, the sheet consisting of a core to which thin layers of a material of different composition have been bonded metallurgically. The coating is generally of relatively high purity aluminum or some aluminum-alloy composition which is highly resistant to corrosion. Several grades and tempers of Alclad are available.

Soundproofing, wood, and hygroscopic materials have a tendency to absorb moisture and to hold it in contact with adjacent surfaces. When such materials are employed, precautions should be taken to provide waterproof protective coatings for the Alclad sheet. One means of doing this is to apply, before assembly, to the properly prepared Alclad sheet surface which will be placed next to the hygroscopic or moisture-absorbing material, a corrosion-inhibitive zinc chromate primer, such as the type described in Navy Department Specification P-27. To this should be added several coats of moisture-resistant paint, as for example, aluminum paint made by mixing 1¼ lb. of fine aluminum paste pigment to each gallon of varnish vehicle.

Special Alclad sheet, which has a coating thickness of 2½ instead of 5½ per cent of the gage, is being offered in gages of No. 16 B & S and thicker. The purpose in reducing the thickness of the coating is to increase the mechanical strength of the sheet. A 2½ per cent coating on

No. 16 is of substantially the same thickness as a 5½ per cent coating on No. 22 sheet, and the author said thinner gages than No. 22 of normal Alclad sheet have proven satisfactory in service.

Alclad (72S)3S is cold-worked duplex sheet that is not responsive to heat treatment, the core material having the same composition as the standard 3S alloy and the 10 per cent coatings consisting of an aluminum alloy known as 72S, which is essentially commercially pure aluminum with 1 per cent zinc added. This

coating has an electrolytic solution potential sufficiently higher than that of the core to afford the electrolytic type of protection characteristic of Alclad sheet. The material is expected to find application particularly in the fabrication of fuel tanks, which in the past have been made largely from the 3S alloy. The mechanical properties of (72S)3S are roughly the same as those of normal 3S alloy in corresponding tempers. Its working characteristics, including welding characteristics, are quite similar to those of 3S. The reason it is particularly useful for the construction of gasoline tanks is that water, which may accumulate in gasoline tanks in operation, has a tendency to collect at the bottom of the tank and may acquire appreciable quantities of heavy metal compounds or even heavy metal particles which are electrolytically corrosive to aluminum alloys. In fact, analyses of waters taken from aircraft tanks in service have revealed that highly corrosive aqueous mixtures may at times exist in the bottoms of aircraft gasoline tanks in service. It is not always practical to apply organic coatings to the interior of tanks, hence an Alclad material with its high resistance to corrosion should be given consideration.

## Measuring Surface Finish

**I**N a paper on "Measuring Surface Finish in Production," read at the S.A.E. national aircraft production meeting, Ernest J. Abbott of the Physicists Research Co., gave a number of examples of practical applications of the Profilometer.

A glass company manufacturing glass by a continuous process, which involves a grinding operation to make the work flat, and a polishing operation with rouge to make the glass clear, had found that the polishing required on some batches was much greater than that required on others. This additional polishing was very costly, and it appeared that the cause lay in variations in smoothness from the grinding line. Differences were not apparent to the eye, but laboratory measurements showed they were present. To obtain suitable control, it was necessary to be able to measure the ground glass at will, and without stopping the line.

A Profilometer was permanently installed on a conveniently located switchboard, and conduit run to the point of measurement. The tracer element and the micro-inch meter

are combined into a single unit which is kept in a small cabinet on a post beside the production line. To make measurements, the operator simply presses a button to turn on the instrument, washes off a suitable area of glass, and takes readings directly on the unit held on the glass as it moves along.

A steel company was interested in controlling the quality of steel sheet used for enameling, lacquering, and similar applications. If such sheets are too smooth, the subsequent finish will not adhere, and accordingly, such sheets are finished on rolls which have been purposely roughened by sand blasting or other means. On the other hand, if the sheets are too rough, the final piece will be rejected because the roughness shows through. Accordingly the roughness must be held between definite limits. As the rolls are used, the surfaces become smoother and must be re-treated. The whole job requires rather close control of roughness on both the rolls and the sheets.

A portable Profilometer was built which can be carried out in the

plant and taken from mill to mill. Sheets can be measured at various steps of the process, and the rolls themselves measured when required. Readings are taken initially to determine what surfaces are being obtained, and what the acceptable ranges in reading are, and occasional checks then serve to control the operations.

An automobile company needed a portable instrument for a variety of work. Engine parts such as cylinder bores, pistons, wrist pins, clutch plates, crank and cam surfaces, etc., are of particular interest. This company has been engaged in developing finer surfaces in production, and

a roughness meter was required to measure progress.

By making suitable measurements, it has been possible to determine what smoothness is best for a given job, to find what factors have to be controlled; to select between methods, machines, speeds, feeds, tools, grits, times, etc., to control quality, and to settle arguments of many kinds. Data have been taken of the roughness of all finished parts in the car, and roughness tolerances have been unofficially maintained on certain parts for some months. Specification of roughness on drawings is now in process of establishment.

of carbon was found on the underside of the intake valves at the completion of all tests.

From a study of the tabulated results it was obvious that the percentage of oxidized products in the used Mid-Continent oils was greater than in the used Pennsylvania oils, as determined by the petroleum ether-insoluble method. The authors pointed out that this does not mean that the oxidized products precipitated as solids in the crankcase. Further consideration of the data revealed that the Pennsylvania oils showed considerably greater increase in viscosity due to polymerization, which is considered a far more serious problem.

The authors expressed the belief that oils made in the conventional manner are more likely to retain the natural stability characteristics of the crude than are the solvent-extracted oils, and none of the oils tested by them were solvent-extracted.

## Fuels and Lubrication

SOME years ago engineers having to deal with the lubrication of internal-combustion engines were chiefly concerned with such causes of troubles as carbon formation in the combustion chamber and on the piston heads, and the thinning out or dilution of the crankcase oil. Today, according to J. V. Brazier and Dr. Sidney Born, who presented a paper at the S.A.E. fuels and lubricants national meeting, the situation is materially changed, especially as regards high-output engines, in which the oil acts not only as a lubricant but also as a cooling agent. The most objectionable carbon deposits now generally form under the piston crowns and under the intake valves, while the lubricating oil tends to increase in viscosity or thicken in service as a result of the formation of cracked and oxidized products.

The authors of the paper had conducted dynamometer tests at the University of Tulsa to compare the relative lubricating values of two Mid-Continent oils with two eastern oils made by similar processes. To accelerate oil-breakdown, high crankcase temperatures were maintained.

Consumption figures were fairly close, being slightly in favor of the Mid-Continent oils. The carbon formed by both Mid-Continent oils was soft and flaky, while that formed by the Pennsylvania oils was very dense and tenacious. The weight of carbon considered is the amount recovered from the piston heads and combustion chamber. The quantity of carbonaceous material recovered from the crankcase was practically the same for all runs. Due to the difficulty of separating this carbon from the used oil, the amount recovered was not weighed.

From a lubrication standpoint, the

condition of the moving surfaces was the same after each run. The piston rings were free in the grooves, with all oil holes open. A heavy deposit

## Inspection System for Aero Engine

TWO papers presented at the aircraft meeting dealt with applications of the Magnaflux method of inspection in aircraft engine production. J. B. Johnson, M.E., chief, Material Branch, Wright Field, said Magnaflux inspections between the several stages in the fabrication of an article will assist in locating the source of cracks or defects which may appear in the finished article. In this field it may well be a means of lowering costs and improving workmanship. The aircraft industry has applied this method of inspection to engine parts, steel propellers and propeller mechanisms, and is gradually extending its use to all airplane parts and accessories which require detailed examination for defects. Where it has been established under competent supervision it has been a success, and it is doubtful if the manufacturers would abandon it and return to the laborious and fallible inspection with magnifying lenses and etching.

B. Clements of the Wright Aeronautical Corporation said the Magnaflux method of inspection probably had caused more discussion between aircraft manufacturers and makers of the steel and forgings than any other new idea in the making and fabrication of steel for many years. The method had been misused, he said, and would continue to be misused, the same as other inspection methods. This misuse was caused by fear, due to the

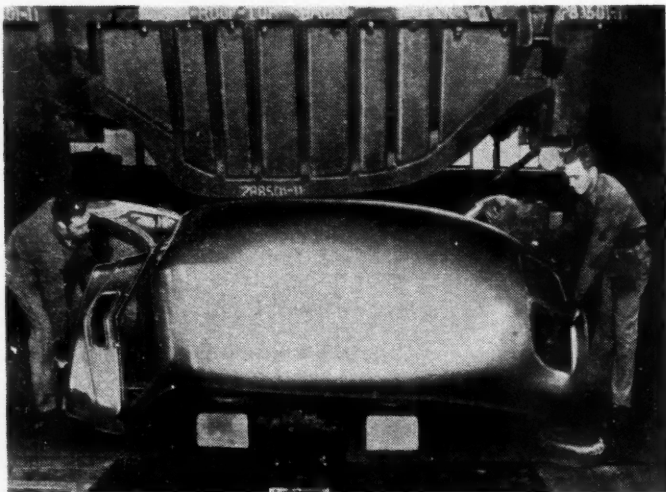
fact that the extent of the imperfection cannot be known from outside appearances. Mr. Clements presented numerous indications given by Magnaflux inspection and discussed the imperfections indicated. He concluded his paper as follows:

"It is only by prolonged investigation and cooperation by the steel mill, forge shop and manufacturer that Magnaflux indications can be reduced and held at a minimum. The usual method of inspection of steel is by microscopic examination, but the surface examined is too small compared with the surface which will later be examined by use of the Magnaflux. Other methods of inspection must be developed, and this will require cooperation with the manufacturer. If all the parts manufacturers take the attitude of rejecting all parts which show indications, the problem cannot be solved and the expense will be materially increased. A careful examination should be made on all indications before the parts are finally rejected."

### New Spray Gun

Burning Brand Co., Chicago, has developed a new spray gun designated as the Master RF-11. Feature of the gun is a push button control for automatically changing over from a fan spray pattern to round. The RF-11 operates on air pressures ranging from 20 to 90 lb.





Chrysler dies and tools for the new lines helped to make up their \$15,000,000 new equipment program. Here is a 1939 De Soto top leaving the press.

## Metal Exposition

Biggest technical event of the year was the National Metal Exposition held in Detroit last week. Literally tens of thousands of people streamed through the doors to comb the exhibits. To us it was a marvelous spectacle unfolding the latest developments in the field of scientific research and commercial exploitation. As a matter of fact, it is no accident that so many thousands of people are eager to learn more about metals, their utilization, their treatment. Our own viewpoint is that the entire future of the automotive industry—the very pulse and trend of engineering advance are intimately tied up with metals.

We have no intention of even attempting a high-spotting of the exhibits. It may be noted in passing that the leading steel mills put on a great show. Not the least of their contribution was the emphasis upon the remarkable development of the extra wide, extra ductile sheets for producing the huge body and fender stampings required today.

Certain exhibits held a particularly dramatic appeal to many of the technical visitors. Here, for example, was the display of Tocco hardening applications for '39. Notwithstanding the importance of production applications for the new models, there was always a crowd around the small machine that demonstrated the Tocco

process for local heat treatment of small gears.

New Jersey Zinc held a brilliant display of zinc alloy die castings, cutting a cross-section of all manner of industries that have taken advantage of the process and material. Interesting it was to observe that automotive designers found the experience of the lawn mower manufacturers, the producers of business machines, and toy manufacturers even more engrossing than the contributions of their own associates. Best reason for this is that the people outside of our industry have provided examples of technique that may well stimulate the thinking of automotive men into entirely new and even more profitable channels. Incidentally, much interest was aroused by the turntable display giving the history of the development of the die cast radiator grille. The spotlight is on Oldsmobile, credited with being the first to adopt this construction. The turntable shows the Olds grilles beginning with the first model in '35, running through the intervening years, including the '39 grille.

The gas industry through the American Gas Association put on a huge display of gas-fired furnaces and equipment with the cooperation of manufacturers. This was balanced in another section by manufacturers producing electrically heated equipment. New processes abounded at

# Production Lines

every turn. Du Pont's new copper-plating process — Chapmanizing; Parkerizing; many others.

Hurriedly skimming some of the alloy exhibits—there was International Nickel — Molybdenum — Vanadium — Titanium — Chromium — combinations of alloy steels. New literature, many items of new handbooks were the rewards for calling at some of the booths. We got our share and will review some of the handbooks very soon for the benefit of those who may like to have copies for their bookshelf.

## On Polaroid

Many of us, no doubt, have read the story of Polaroid and its automotive applications in September *Fortune*. However, everyone concerned with motor car development and safety on the highways should be sure to see every side of the picture, so fairly presented in the article. Consider, in the first place, that the effectiveness of Polaroid would depend largely upon the ability to install lenses and windshield analyzers in every vehicle on the road. That appears to be a more serious problem than the installation of safety glass, for example. No one yet knows clearly the cost involved even in a complete factory installation. But of even more importance is the fact, "seeing" still is the big problem. We need a high level of illumination for clear vision. One reputable research organization that has given the matter some considerable study, believes that the use of polarized light may require approximately three times the wattage used at present, to effect the same clear road seeing. This necessarily implies the need for real power plants—larger and more expensive generators, more copper, better regulation, better switches. While this type of equipment would mean a large increase in the cost of the electrical system of any car, consider how difficult it would be to make such equipment available on a car already on the road. Our object is not to place obstacles in the way of an impressive new development, but merely to indicate some of the obstacles that must be overcome.—J. G.

# What Can Be Gained by Pilot Injection?

By DR. P. H. SCHWEITZER\*

**P**ILOT injection has been "discovered" at least a dozen times in the last 20 years. The idea that the ignition lag of the main spray can be reduced or eliminated by a preceding ignition of a pilot spray is sound. Results have been published substantiating such claims. Yet the idea has never been commercialized. An investigation recently conducted on pilot injection at The Pennsylvania State College Diesel Laboratory throws some new light on the subject.

A 3¼ x 4¼-in. 900 r.p.m. swirl-chamber engine was used in the experiments, with a compression ratio of 15.8 to 1. Two completely independent injection pumps and nozzles were employed. The identical fuel pumps (Bosch PEIB50A302/3S97) had a 5-mm. plunger diameter and a 10-mm. stroke. They were driven from a common shaft, and both had independent injection-timing control. The nozzles (Bosch DN30S3) were also identical, and both were mounted in the swirl chamber as shown in Fig. 1. An electromagnetic pickup was mounted in the chamber to indicate the cylinder pressures by means of a cathode-ray oscillograph. Needle-valve lifts were recorded by mounting pickups on the valve stem of both spray nozzles. Pressure and needle-lift records were traced from the screen of a Standard-Sunbury cathode-ray indicator, which also permitted throwing a timed degree

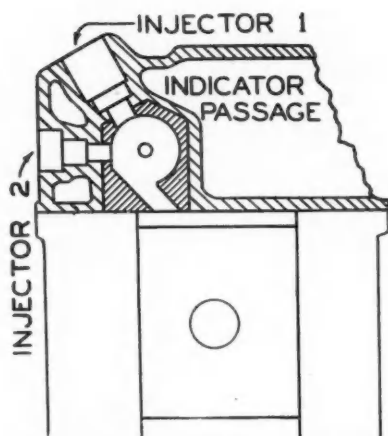


Fig. 1—Arrangement of injectors and indicator in double injection tests

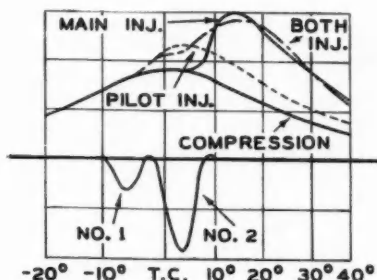


Fig. 2—Pilot injection eliminates knock.

	Injection Timing B.T.C.	Injection Quantity Mm. <sup>3</sup> /Stroke	M.R.P.R. Lb./Sq. In./Deg.	Smoke Density
Main injection only	-1°	22.5	52	10
Pilot injection only	-10°	3.5	24.5	12
Main and pilot inj.	-10°-1°	26.0	36.5	18

scale on the screen for reference.

With suitable timing and quantity setting of both pilot spray and main spray, truly astonishing results could be obtained. By just switching the pilot spray on and off, we could make the knock disappear and reappear. Without pilot spray the knock sounded as a sharp ping, while with the pilot spray turned on, the knock vanished as if combustion had been cut out altogether.

Figs. 2 and 3 show indicator cards of such cases. Both were taken with a 55-cetane fuel, with settings indicated on the figures. The lines above the axis represent cylinder pressures, and those below, spray nozzle needle-lifts to an unspecified scale.

In Fig. 2 the main injection started 1 deg. before top center. Ignition occurred at about 8 deg. after top center, and was accompanied by a sharp knock. The maximum rate of pressure rise (recorded directly with the Standard-Sunbury cathode-ray indicator) was 52 lb. per sq. in. per deg. The pilot injection started 10 deg. before top center, and ignition took place about 2 deg. before top center. Due to the small injection quantity, combustion was smooth, the maximum rate of pressure rise produced by the pilot injection alone exceeding only slightly the maximum rate of compression pressure rise (15.25 lb. per sq. in. per deg.). However, both injectors operating, the resulting combustion was very much smoother than when the pilot injection was out. This is also evidenced by the more gentle rise of the pressure curve (dash-

dot) and the maximum rate of pressure rise, which measured only 36.5 lb. per sq. in. per deg. compared with 52 without pilot injection. In this case the setting of the main pump was not altered in any way. The smoke density was measured as 10 without, and 18 with pilot injection. In view of the fact that smoke density below 50 is practically invisible to the naked eye (see AUTOMOTIVE INDUSTRIES, Aug. 20, 1938), the exhaust was clear in both cases.

In Fig. 3 the knock reduction was still greater. The maximum rate of pressure rise fell from 89 to 36.5 lb. per sq. in. per deg. when the pilot injection was switched on. In order to know how the engine output is affected by the pilot spray (if no attention is paid to the knock), the injection quantity was increased in both cases up to the limit of clear exhaust (smoke meter reading 50).

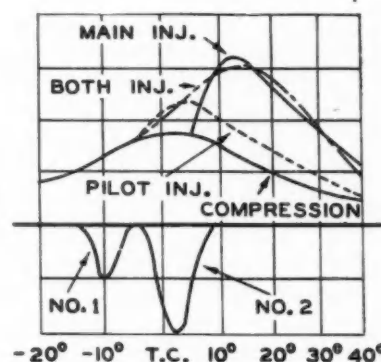


Fig. 3—Pilot injection boost output.

	Injection Timing B.T.C.	Injection Quantity Mm. <sup>3</sup> /Stroke	M.R.P.R. Lb./Sq. In./Deg.	Smoke Density
Without pilot inj.	-3°	25.2	89	50
With pilot injection	-13°-3°	26.8	36.5	50

The result was that the power output was about 6 per cent greater with pilot injection, which is by no means negligible. Of course, if the power output had been compared on an equal-knock basis, the case of the pilot spray would have been much more favorable.

Excellent results can be obtained with pilot injection if high cetane fuel is used for the pilot spray. Fig. 4 shows a case where 74-cetane fuel was used for the pilot spray and 55-cetane for the main spray. The possibilities of such combinations have not been fully explored.

The tests described offer sufficient proof for the contention that pilot injection may reduce the combustion knock considerably, and increase the power output appreciably. However, not every application of pilot spray showed such spectacular results as those described. The effect depends greatly on the timing

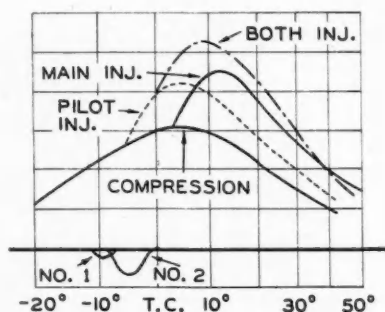


Fig. 4—High-cetane fuel in pilot spray eliminates knock effectively.

	Injection Timing B.T.C.	Injection Quantity Mm. <sup>3</sup> /Stroke	M.R.P.R. Lb./Sq. In./Deg.
Without pilot inj.	-9°	8	92
With pilot injection	-11°-9°	11.2	58

and quantity setting of both nozzles. For best results we have found that the pilot spray must not be more than 15 per cent of the main spray. It must begin 10 to 15 deg. before top center. The main spray must follow by 8 to 10 deg. the pilot spray, if 55-cetane fuel is used for both. If high-ignition-quality fuel is used for the pilot spray the spacing should be closer. With adjustments different from these, the benefit was smaller or nil.

We could stop the story here. The comments that follow may even be considered extraneous. But we feel that many readers will consider them very pertinent.

Instead of going to the trouble of using two pumps and two spray nozzles, some investigators tried to secure pilot effect by double toe-cams or double seat nozzles, etc., with some success. By cut-and-try, a simple process, we have obtained a pilot effect by means of a simple pump and a simple pintle-type nozzle. With a certain injection-tube length and nozzle opening pressure, the valve needle-lift at certain pump speeds is such that a little hump is visible before the main lift. Such a condition is not perfectly stable, as with a change in speed the hump may disappear. Nevertheless, it can be reproduced regularly within a certain speed range and within wide load limits. When the injection is such, the combustion is surprisingly smooth. Fig. 5 shows an example. The curve below the axis is the oscillogram of the needle lift. The little

hump near 10 deg. before top center was not produced by a trick nozzle or trick pump. Common differential nozzles in conjunction with jerk pumps regularly display such action under certain conditions of pump speed, valve opening pressure, line length, etc. Test men are frequently annoyed by this valve behavior, because it is conducive to erratic injection timing. At a lower speed the hump may disappear altogether and when the speed is increased it usually grows to a full-size injection. But while "a baby," it works wonders. It makes the combustion as smooth as any pilot injection. Note the gentle rise of the pressure curve. The maximum rate of pressure rise is only 40 lb. per sq. in. per deg., while the load (33 mm<sup>3</sup>. per stroke) is 23 per cent more than the best we obtained with pilot injection, Fig. 3. At this output the exhaust was clear (30); in fact, clearer than the "clear exhaust limit" used in the pilot-spray tests.

The performance shown in Fig. 5 was not an accident. We could reproduce it consistently, and the effect persisted from ¼ load to overload. A small early hump in the

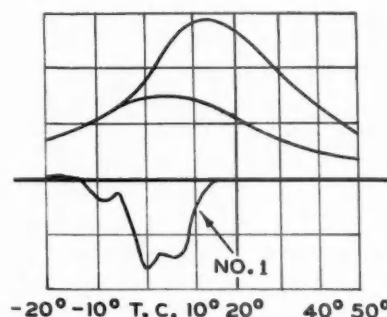


Fig. 5—Well-tuned single injection outperforms double sprays.

needle-lift curve was always accompanied by very smooth combustion. This fact suggests that injection control is more important than anything else for smooth combustion.

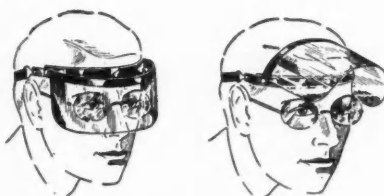
Our investigation showed the close correlation between injection characteristics and combustion smoothness. Injection-control can be effected by double spray or a single spray suitably conditioned. Our investigation has not answered the question whether the control of a regular single spray can always be effected safely and effectively.

## Eyeshield

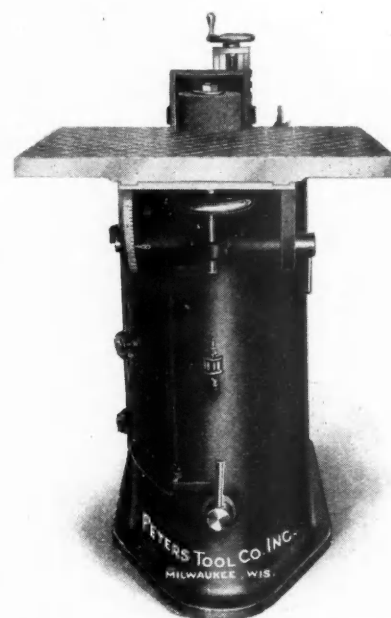
... Jackson protection device designed for general industrial use

The Jackson Electrode Holder Co., Detroit, has developed another industrial eyeshield which it calls Type C. The shield, illustrated herewith, consists of a flexible, transparent, non-inflammable visor which is adjustable and is hinged to a light headgear. Various types of visors are available, including clear, smoked, light green, dark green or amber.

The manufacturer claims the following advantages for the shield: It does not interfere with the wearing of eye glasses; ample ventilation eliminates fogging; protection is afforded from front and both sides by the visor; and hot metal rolls off the visor without marking it.



Jackson Type C industrial eyeshield.



The new vertical oscillatory grinding machine which was placed on the market a short time ago by the Peters Tool Co., Inc., Milwaukee, Wis., is shown above. Features of the equipment are set forth by the manufacturer as follows: simple, compact design and construction; taper take-up bearings with large oil chambers; all bearings and wearing surfaces entirely enclosed; oscillating mechanism operating in oil.

The grinders are equipped with double Texrope drive, 1½-hp. Allis-Chalmers ball-bearing a.c. motor. Speed of the wheel is 5000 r.p.m.



## Four Nash Series Offered for 1939

(Continued from page 525)

read the indications of the driving instruments. The speedometer is of the ribbon type, all speed marks being along a horizontal line. A chrome-strip grille in the instrument panel provides a space for both the speaker and an automatic-tuning radio. With the latter, stations are tuned by merely pushing one or another of six buttons, so the driver need not take his eyes off the road when tuning. All control dials and knobs, as well as the bases and knobs of interior hardware, are of translucent plastic material. On the Ambassador Eight the door posts are equipped with a new type of striker plate, which eliminates the need for slamming.

The fuel-tank filler pipe, while outside the car, does not run through the trunk. When the car has the optional column-mounted shift lever, the front compartment

is entirely clear, as the hand brake is under the cowl at the left.

On all sedans, hypoid gears are used for the final drive, to eliminate the need for tunnels in rear compartments. An automatic fourth-speed gear (overdrive) is standard equipment on the Ambassador Eight and optional on other series. An automatic choke is provided on the Ambassador series. The starter is operated by depressing the clutch pedal. The ignition lock, which also locks the steering gear, is lit up at night by a small lamp. In the frame the side channels have been widened at the rear and a Z member added just ahead of the fuel tank.

The new conditioned-air system is said to take up to 800 cu. ft. of outside air per minute and to maintain a slight over-pressure in the interior. As a result, the flow of

air is always outward. The system is controlled by means of a knob on a dial which adjusts a thermostat. Fresh air enters through the cowl ventilator. An intake housing with a rainshed which prevents moisture from entering the car is located just below the ventilator and is standard on all cars. The remainder of the conditioned-air system is an extra on all except the Ambassador Eight series. An air filter fits into the housing behind the rainshed. The rest of the system is installed under the cowl, just below the ventilator, while the control dial is immediately below the instrument panel. By means of the control knob the full blast of heated air from the conditioned-air system can be turned upward through vents in the windshield molding, against the windshield, for defrosting purposes.

## Methanol-Base Anti-freeze Solutions Amplify Cooling

(Continued from page 527)

tions containing 30 per cent methanol-base, and 35 per cent glycol-base anti-freeze were made up, and a series of cars were run with these cooling solutions all winter. All losses were made up with stock solutions—not with the anti-freeze. At the end of the season the methanol solutions in the cooling systems had an average freezing point only 6 deg. Fahr. lower than that of the stock solution, whereas the glycol solutions had a freezing point very slightly higher than at the beginning of the season. The engineers of the du Pont company found that most of the loss of cooling fluid is by leakage and overflow, and that only about 10 per cent of the total loss is due to evaporation. As a result of this observation the "Zerone" Division of the du Pont Company recommends that replacements be made with solutions of anti-freeze—not with straight anti-freeze or straight water, as seems to have been common practice to date. The loss due to overflow resulting if the engine is shut down while hot is a real problem, and one proposed solution is the provision of what is variously referred to as a surge tank, an expansion tank or an overflow tank, which has long been known to the automotive industry. This consists of a tank of about two

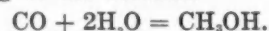
quarts capacity, from the bottom of which connection is made to the overflow pipe of the radiator. The tank is vented on top. If boiling and expansion occur when the engine is shut down, the liquid forced out of the cooling system flows into the surge tank. An air-tight radiator cap is used, and after the engine has cooled down, the steam in the cooling system condenses and a partial vacuum forms there, which draws the cooling liquid in the surge tank back into the cooling system. By providing a surge tank on the cooling system the normal loss of 2-3 quarts per 1000 miles can be reduced to half a quart for the same distance. The capacity of the surge tank, of course, must be adequate. For small cars a capacity of 2 quarts is recommended, and a capacity of one gallon is better.

It may be of interest to learn why the methanol-base anti-freeze Zerone is being produced by the Ammonia Division of the du Pont concern. Methanol, like ammonia, is a synthetic product synthesized from the raw materials coal, water and air or, more directly, from coke, steam and air. Ammonia is a compound of hydrogen and nitrogen, and the hydrogen required for the synthesis of ammonia is produced by the water-

gas process according to the chemical formula



that is, the products of the water-gas process are carbon monoxide and hydrogen. But carbon monoxide and hydrogen combine into methanol according to the formula



This chemical transformation is carried on at high temperature and high pressure in the presence of catalysts. Methanol is not the only product formed under these conditions; as it comes from the retorts the product is contaminated with water and higher members of the alcohol series. Both of these are less desirable than methanol from the anti-freeze standpoint, and they are therefore separated by distillation.

The du Pont Company has been selling an anti-freeze of methanol base since 1930, but the trade name Zerone has been used only since 1934 and covers a somewhat different product than that marketed previously. The original methanol-base anti-freeze contained 25 per cent water, which made it equal to ethyl alcohol as regards capacity to depress the freezing point of water. It also did not contain the corrosion inhibitor which is now added.

# 100 per cent Reader

## MODERNIZATION

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